

## CAVALRY EQUIPMENT OF THE ROMAN ARMY IN THE FIRST CENTURY A.D.

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### INTRODUCTION

The main aim of this paper is to identify and describe the elements that went together to make up Roman military horse (or riding) harness in the first century A.D.<sup>1</sup> Closely linked with this, however, will be a consideration of just how much the archaeological evidence can tell us about the military use of mounts.<sup>2</sup> It is to be hoped that the present work will at least serve to generate new interest in cavalry equipment and provoke discussion about the functions of its various components.

There are two main source areas for the study of Roman military horse equipment: monuments depicting its use and artefacts recovered from the archaeological record.

Pictorial evidence, most notably that represented by sculpture, can be used to show how the various elements of horse harness functioned as a whole. The value of such depictions is hotly debated, but it is generally true that funerary monuments tend to give a more accurate picture than official sculpture, although both categories vary widely in quality.<sup>3</sup> Two types of tombstone, the 'Reiter' and the 'Totenmahl' are characteristic of the first century A.D. (although not exclusively so):<sup>4</sup> these show, in the first instance, the deceased cavalryman riding his mount in combat, often with a cowering barbarian being trampled beneath the horse;<sup>5</sup> the other type depicts the dead man enjoying a funerary banquet in the afterlife in an upper scene, whilst his horse is paraded in all its equipment in a lower.<sup>6</sup> Totenmahl depictions usually show the horse being controlled from behind by means of long-reins and with its saddle covered by an overblanket, whilst the trooper's calo carries spare spears (javelins?). As has been noted, the quality could vary and there are cases where the sculptor probably did not understand his subject matter, but some of the best pieces, like the stone of T. Flavius Bassus at Köln, appear to be detailed documents of the way in which horse harness functioned.<sup>7</sup>

As well as private funerary monuments, mention must be made of official sculpture, if only to sound the now customary note of caution about interpreting it too literally. It is certainly important to appreciate that Trajan's Column, which is traditionally regarded as a prime source of information about the Roman army,<sup>8</sup> includes a number of clues to the fact that it is not a useful source for the study of cavalry equipment, and these will be outlined later in some detail. Much the same is true of most of the major monuments of the city of Rome,<sup>9</sup> but examination of some provincial sculpture of an official nature is more productive. The triumphal arch at Orange,<sup>10</sup> which is probably Tiberian, is a good example of this, with important details about harness being confirmed by the static weapons friezes, whilst the battle scenes provide an interesting comparison with the depiction of Roman cavalry on the Rhineland tombstones.

Archaeological evidence is usually manifested either as individual items of equipment, recovered during the process of excavating a site, or hoards of horse equipment which have been gathered for some purpose.<sup>11</sup> Site finds tend to include a wide range of types of any given fitting, whilst hoards often have a narrower stylistic range. A large proportion of published site finds come from excavations where stratigraphy was inadequately understood and, frequently, where the spatial distribution of finds was not considered to be of interest.<sup>12</sup> Site finds can also usually be fitted within a broad date range for a site, and nowadays, as excavation (and recording) techniques improve, can be placed within a narrower chronological bracket.

The fact that a number of hoards of Roman horse equipment have been recovered is extremely important for the interpretation of horse harness. Such hoards include the collections from Doorwerth and Xanten, Fremington Hagg, and Canterbury.<sup>13</sup> The dating of these assemblages is often problematic, but their value in interpreting the functional relationships of the various elements is inestimable.

#### REPRESENTATIONAL EVIDENCE

A comparatively large number of figured first-century tombstones which show mounted soldiers have survived. Some show the harness in great detail, most are indifferent, whilst a few are positively crude in the standard of their depiction of detail. The evidence presented is equivocal, as the following selective survey of some of the more important pieces shows.<sup>14</sup> Unfortunately, some details are not very clear on photographs and some tombstones, such as that of Primigenius, do not reproduce at all well.<sup>15</sup>

##### 1. Flavinus (Reiter, ala Petriana)<sup>16</sup>

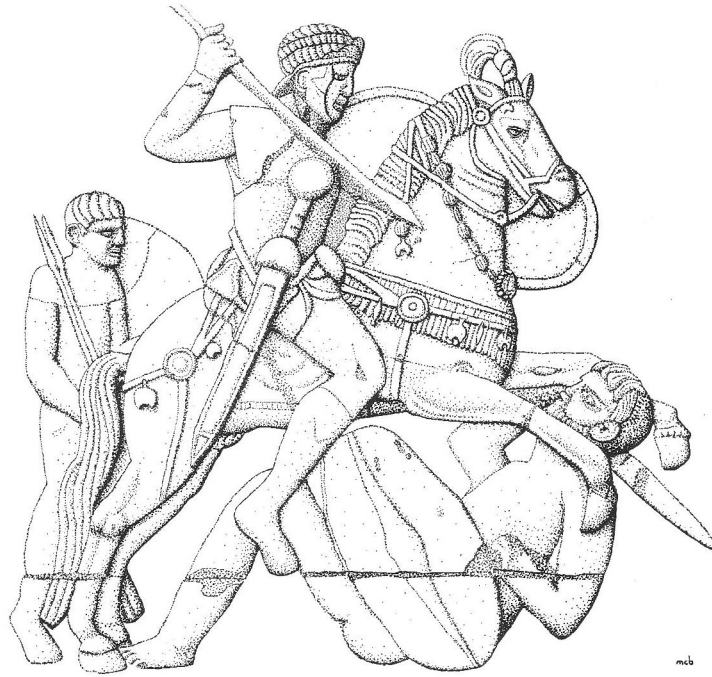
Hexham

A stone with probable phalera junctions. Both junctions have straps passing horizontally beneath the saddle blanket and no distinct saddle is depicted. No pendants are shown, but the pendant straps at both junctions have lunate terminals. There are no clear saddle pommels and the saddle blanket (which appears to be fringed) does not hang below the horse's belly. A breastband is worn, as is a neck strap. Late Flavian.

##### 2. Rufus Sita (Reiter, cohors VI Thracum)<sup>17</sup>

Gloucester

This tombstone has a phalera junction on the haunch, but a simple band at the front, which passes horizontally beneath the rider's thigh. One strap passes from the rear junction to the saddle. There are no pendants and no saddle blanket or bridle are depicted (suggesting that they may have been added in paint). Claudio-Neronian.



**Fig.1:** Relief from tombstone of T. Flavius Bassus.



**Fig.2:** T. Flavius Bassus. Detail of haunch junction, showing haunch straps passing beneath saddle pommel. Köln Museum.



**Fig.3:** T. Flavius Bassus. Detail of horse's breast showing breast band and pendants. Köln Museum.



**Fig.4:** T. Flavius Bassus. Detail of horse's head with bridle, bit, hackamore, and poll knot. Köln Museum.



3. Sextus Genialis (Reiter, ala Thracum)**18**

Cirencester

There is a phalera junction on the haunch, but no clear junction at the shoulder. The harness straps are bordered, as are the reins and haunch pendant strap (the latter is also fringed). The haunch strap passes horizontally beneath the saddle blanket. The breast strap broadens towards the centre of the animal's breast. No pendants are shown, but the bridle is studded with phalerae. The saddle (with pommels) is depicted, over a fringed saddle blanket. There appears to be a suggestion of triplet straps beneath the sword, at the edge of the blanket. Claudio-Neronian.

4. Longinus (Reiter, ala I Thracum)**19**

Colchester

Phalera junctions are indicated on this stone, the phalerae being decorated with rosettes. Both the shoulder and haunch junctions feature bifurcating straps, the upper strap in each case passing horizontally beneath the saddle blanket, whilst the lower straps pass downwards. Three pendant straps hang from each phalera and there is a lunate pendant at the breast. Saddle pommels are shown and there is a saddle blanket which appears to be fringed (although the fringe is ambiguously rendered). There is a bordered neckstrap and the bridle has a small phalera (at the junction of the throatlatch, cheekpiece, headpiece, and browband, the latter also having a lunate pendant in the centre of the horse's forehead). The tail is bound. Claudian.

5. Oclatius (hybrid, ala Afrorum)**20**

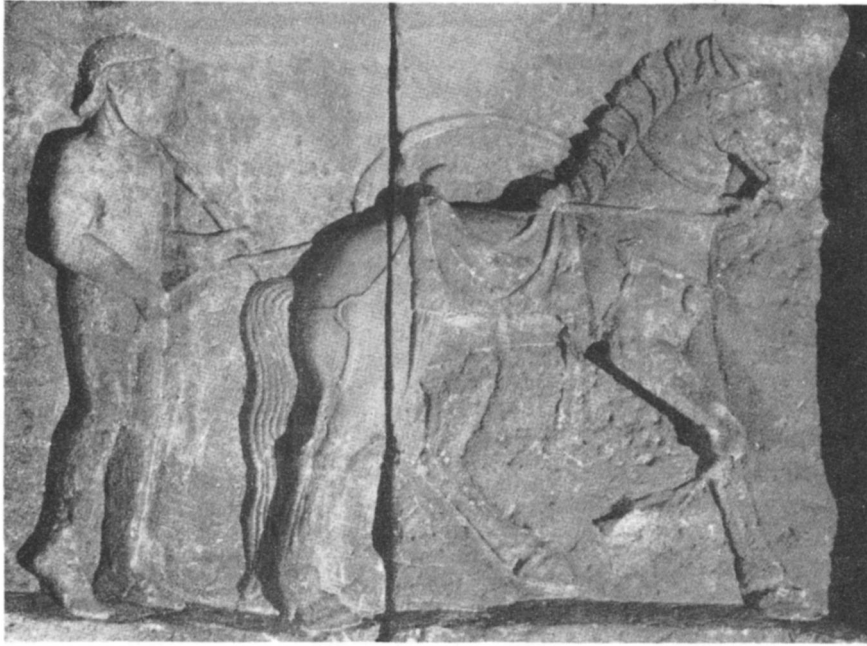
Neuß

No harness is shown, apart from a breastband and neckband, picked out in outline. A long fringed overblanket (which hangs below the horse's belly) covers the saddle, the pommels of which protrude. The bridle is depicted and the animal wears a poll-knot, as well as having its tail bound. Flavian.

6. T. Flavius Bassus (Reiter, ala Noricorum; Figs.1-4)**21**

Köln

Two phalera junctions are shown, each with bifurcating straps passing from them towards the saddle. All four straps pass under the pommels of the saddle (Fig.2). There are lunate pendants suspended from the breeching, the lower of the haunch straps, and two from the breast strap. There is a narrow lozenge-shaped pendant between the two lunate ones on the breast strap, and another one on the lower shoulder strap. The usual pendant straps hang from the phalerae. The breast and shoulder straps are divided up by vertical lines, possibly indicative of strap-mounts. The saddle blanket is fringed and does not hang below the horse's belly. There is a girth (just by the rider's knee), a broad breastband, apparently fringed, beneath the breast strap (Fig.3), and a neck strap decorated with pompons and attached to a phalera on the breast; this is also apparently related to a pendant strap (likewise decorated with a pompon) terminating in a lunula that hangs over the horse's neck. On the bridle, there is a small phalera on the junction. A lunate pendant is suspended from the browband on the animal's forehead and there is a small one just above its eye, whilst its mane



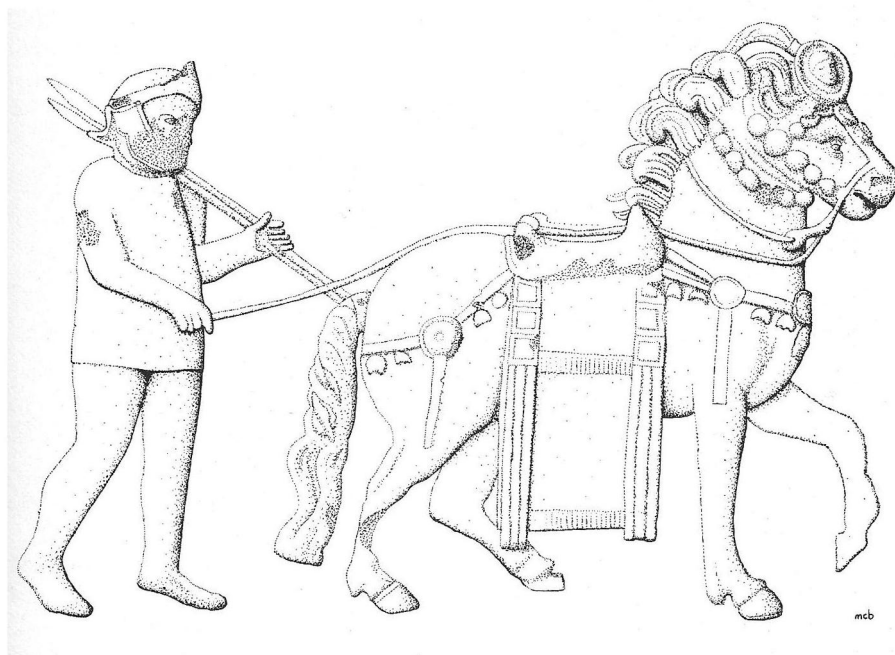
**Fig.5:** Relief from tombstone of Longinus Biarta. Köln Museum.



**Fig.6:** Relief from tombstone of Romanus Dardanus. Köln Museum.



**Fig.7:** Relief from tombstone of unknown cavalryman. Köln Museum.



**Fig.8:** Relief from tombstone of M. Sacrius Primigenius.

is tied in a poll-knot (Fig.4). Late Flavian.

7. Longinus Biarta (Totenmahl, ala Sulpicia; Fig.5)**22** Köln

This stone depicts phalera junctions, a haunch strap passing up to the saddle (concealed under a cover), as does the shoulder strap. The haunch strap appears to broaden towards the saddle, suggesting that bifurcation is intended. There is a lunate pendant on the breast strap and the usual pendant straps at the junctions. The fringed cloth covers the saddle, although the pommels protrude, and the lower portions of triplet straps are visible beneath it at the front and rear. There is a small phalera on the bridle. The animal is being guided on long-reins by a calo. Flavian.

8. Romanus (Totenmahl, ala Afrorum ; Fig.6)**23** Köln

Phalera junctions are shown again, with bifurcating haunch and shoulder straps. There is a lunate pendant suspended from the breeching and two on the breast strap, the one in the centre of the animal's breast being larger than the other two. A fringed saddle-cloth is worn over the saddle, although the pommels protrude. Triplet straps hang below this shabracque, which is not long enough to hang below the horse's belly. A ring is clearly visible in the reins. The horse is being guided on long-reins. Flavian.

9. Unknown (Reiter, unit unknown; Fig.7)**24** Köln

This stone portrays junctions of the phalera type, with single haunch and shoulder straps; the haunch strap passes under the rear saddle pommel, whilst the shoulder strap clearly passes under the saddle blanket. There is a breast junction with another phalera and a martingale is visible. All of the harness straps are divided up by vertical lines, possibly indicating strap mounts. No pendants are shown, but the rear pendant strap is divided up like the main harness straps (the front strap is badly damaged). The saddle pommels are evident and the curved lower edge of the saddle is very clearly depicted. The saddle blanket does not appear to be fringed and no bridle is shown, so these may have been added in paint. Neronio-Flavian?

10. M. Sacrius Primigenius (Totenmahl, ala Noricorum; Figs.8-9)**25** Köln

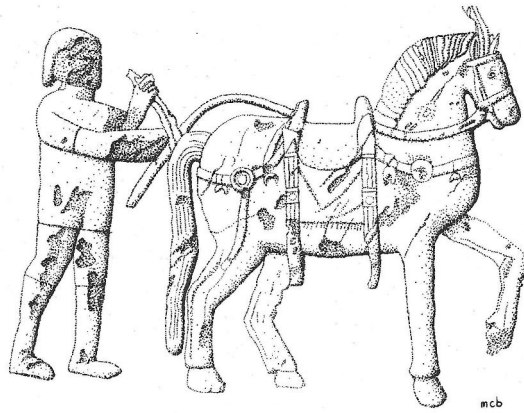
The horse on this stone has phalera junctions with bifurcating haunch and shoulder straps. In both cases, these pass under the pommels of the saddle. There are two lunate pendants on each of the breeching, lower haunch, lower shoulder, and breast straps, as well as a larger one in the centre of the animal's breast, this latter being suspended from a phalera (where there are also possible traces of a martingale). The usual pendant straps are shown and there are two sets of triplet straps, reaching almost to the ground, and to the top of these are fixed three rectangular plates on each. Two fringed saddle-cloths are being worn, one long and the other short: both appear to be worn under



**Fig.9:** M. Sacrius Primigenius. Detail of horse's head, with bridle, bit, poll knot, and phalera. Köln Museum.



**Fig.10:** Relief from tombstone of Lucius. Köln Museum.



**Fig.11:** Relief from tombstone of Oluper.



**Fig.12:** Relief from tombstone of Niger. Bonn Museum.

the saddle and the triplet straps, the short one being over the longer. A neck strap, which may be decorated with pompons, is depicted, and the bridle is decorated with a number of small phalerae. There is a poll-knot, to which is fixed a large upstanding phalera, possibly decorated with a bust (Fig.9). The mane is gathered into pairs of small tufts all down the horse's neck and the tail is bound. The horse is being guided on long-reins by a calo. Flavian.

11. Lucius (Totenmahl, ala Afrorum; Fig.10)**26**

Köln

The phalera junctions on this tombstone reveal bifurcating shoulder straps, but only a single haunch strap. Two lunate pendants are suspended on each of the breeching, haunch, and breast straps and one on the lower shoulder strap. There is a large phalera in the centre of the breast, from which is suspended a further lunula. There are two pendant straps hanging from the junctions. As with Primigenius, There are two sets of triplet straps hanging over two saddle blankets, one short and one long. However, no fringe is shown on either of the cloths and these may have been added in paint. The divisions of the triplet straps start at the bottom of the shorter cloth, which may indicate that saddle plates, like the fringes, would be picked out in paint. There is a neck strap with pompons and a breast band (which broadens towards the centre of the chest) is being worn beneath the breast straps and pendants. The bridle is decorated with small phalerae, with a slightly larger one at the junction. There is a poll-knot, to which a large upstanding phalera is attached. The animal is on long-reins. Flavian.

12. Oluper (Totenmahl, ala Afrorum; Fig.11)**27**

Köln

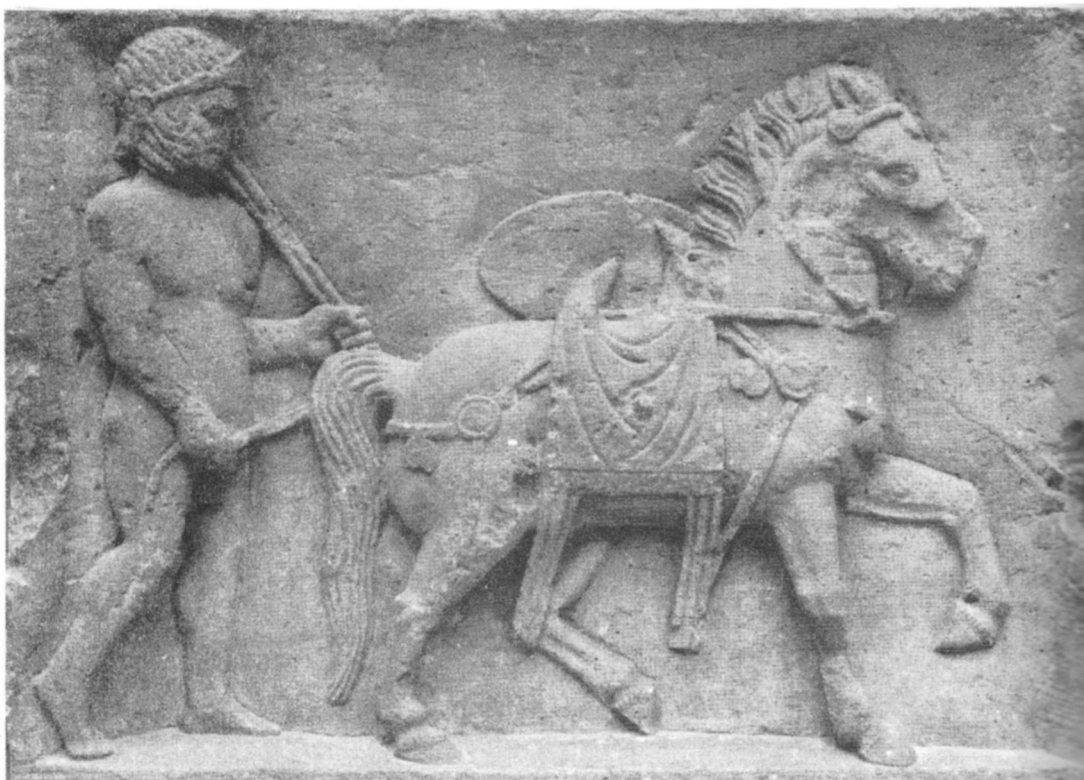
The harness on this animal has two visible phalerae, that at the haunch having two bifurcating straps passing to the saddle, whilst the one at the front has only one. There are lunate pendants (one of each) on the breeching, lower haunch, and the shoulder straps, along with a possible central one at the breast. The rear pendant strap survives but none is visible at the shoulder. The harness straps appear to have vertical divisions. The pommeled saddle, with its curved lower edge, is shown over a short, fringed saddle blanket. Two sets of triplet straps hang from the saddle, each having a small rectangular plate, with a circular boss, half way down. The horse wears a poll-knot and is on long-reins. Flavian.

13. Niger (Reiter, ala Pomponiana; Fig.12)**28**

Bonn

The junctions at the shoulder and haunch on this horse are of the ring type. At both junctions, one strap passes up to the pommeled saddle and the usual pendant straps are in evidence. There is a lunate pendant in the centre of the animal's breast. The saddle blanket appears to be either bordered or double thickness and there is a girth passing under the horse's belly towards the front. Tiberio-Claudian.





**Fig.13:** Relief from tombstone of M. Aemilius Durises. Bonn Museum.



**Fig.14:** Relief from tombstone of Vonatorix. Bonn Museum.



14. Reburrus (Reiter, ala Frontoniana)**29**

Bonn

The shoulder and haunch junctions are formed from large phalerae, but it is not clear how many straps pass from these to the saddle, although they may be single in both cases. There is a large lunate pendant on the horse's breast and the rear pendant strap survives. The saddle pommels are evident, as is the curved lower edge of the saddle. Triplet straps hang from the front and the rear, at the edge of the short fringed shabracque. There is a small phalera on the bridle. Claudio-Neronian.

15. C. Iulius Primus (Totenmahl, ala Noricorum)**30**

Bonn

A phalera junction is shown on the haunch of this animal (with bifurcating straps which pass beneath the saddle-cloth, rather than towards the saddle), but no junction at all is shown on the shoulder. There are lunate pendants on the breeching, lower shoulder strap, shoulder, and in the centre of the breast. A long saddle-cloth is worn, over which hang two sets of triplet straps, each of which bear four rectangles separated by narrow bars. The pommels of the saddle are raked backwards. A breast band is worn and the horse is apparently on long-reins. Flavian.

16. M. Aemilius Durises (Totenmahl, ala Sulpicia; Fig.13)**31**

Bonn

This horse is portrayed as having phalera junctions with bifurcating haunch and shoulder straps. There is one lunate pendant on each of the breeching, lower shoulder, and breast straps, along with the customary pendant straps. A fringed saddle-cloth covers the saddle, although the pommels protrude, and triplet straps hang beneath the blanket. There is a small phalera on the bridle and a lunate pendant suspended from the browband on the forehead of the horse. The tail is bound and the animal is being guided on long-reins. Flavian.

17. Vonatorix (Reiter, ala Longiniana; Fig.14)**32**

Bonn

There are phalera junctions at the haunch, shoulder, and breast positions, only one strap passing to the saddle (over the blanket) from each of the former two. There are no pendants, but pendant straps hang from the shoulder and haunch junctions. The saddle pommels are depicted and there is a short fringed saddle-cloth, beneath (and towards the front of) which a girth can be seen passing under the animal's belly. There are two phalerae on the side of the bridle and another in the centre of the browband. Tiberio-Claudian.

18. Cantaber (Reiter, unit unknown; Fig.15)**33**

Mainz

The hindquarters of this horse are now missing, but are visible in Éspérandieu's published photograph. This stone features ring junctions, although since these are close to the saddle it is not possible to discern how many straps pass to it. Triplet straps appear to hang from the ring, but otherwise there are no pendants. Horns are visible on the



**Fig.15:** Relief from tombstone of Cantaber. Mainz Museum.



**Fig.16:** Relief from tombstone of C. Romanus Capito. Mainz Museum.

saddle and a short shabracque is worn under it. A girth strap passes over this cloth at its front. Tiberio-Claudian.

19. Silius (Totenmahl, ala Picentiana)**34**

Mainz

This stone depicts phalera junctions, with one haunch and two shoulder straps passing to the saddle. There no pendants, although pendant straps are depicted at the junctions (but that at the shoulder has been defaced). The pommeled saddle sits on a fringed saddle-cloth of the shorter kind, with a girth passing beneath it towards the front of the horse's belly. Triplet straps descend from the saddle. The breast junction is formed by another phalera, from which descends a martingale. The tail may be bound and the animal is on a leading rein, possibly the long-reins (the riding reins, which have a ring in them, lie across its neck). Flavian.

20. Petronius Disacetus (Reiter, cohors VI Thracum)**35**

Mainz

Large roundels decorated with rosettes form the haunch and shoulder junctions on this piece. A single haunch strap is visible, but the shoulder strap(s) are hidden by the rider's thigh. There is a lunate pendant in the centre of the horse's breast and the pendant straps are present. The pommeled saddle rests on an indistinct (fringeless) saddle-cloth and a set of triplet straps descends at the rear, whilst at the front a girth can be seen. The reins are bordered and have a ring in them. Claudian.

21. Andes (Reiter, ala Claudia)**36**

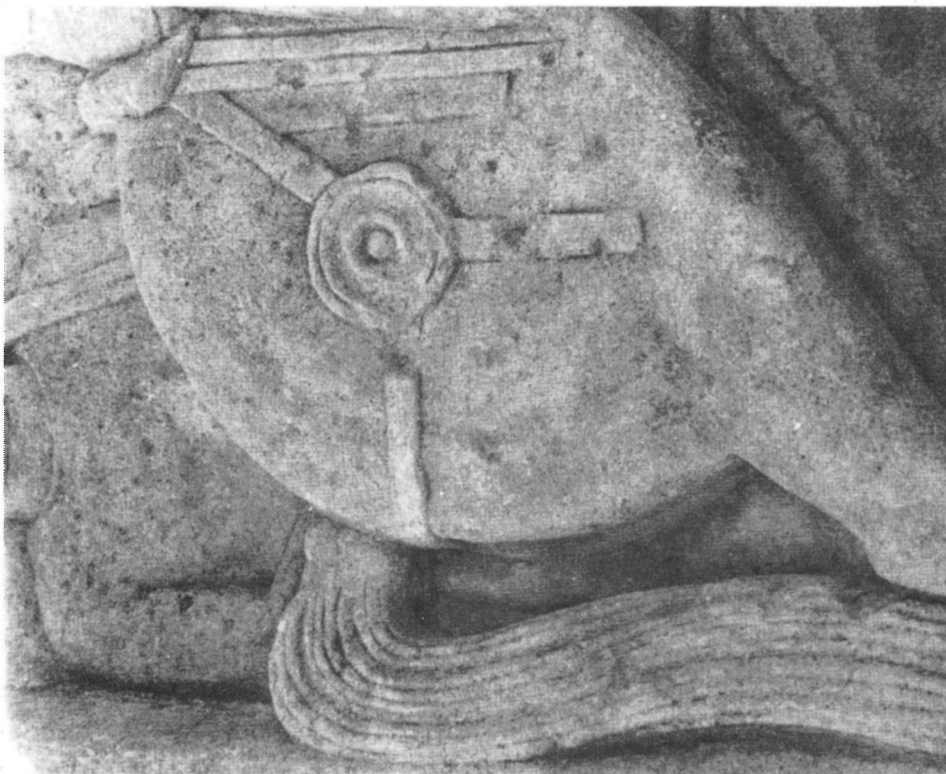
Mainz

No junctions are apparent, but the breeching and breast straps are decorated with small phalerae (two on each). The breeching passes more or less in the direction of the saddle, but the shoulder strap is almost horizontal as it passes beneath the saddle blanket. There is a pendant strap half way between two phalerae on the breeching, but otherwise no pendants. The saddle pommels are evident as is a flaring saddle-cloth, on which there are two clear sets of triplet straps (one to the rear and one beneath the rider), with a possible third set (perhaps confused with a pendant strap?) in front of the rider's thigh. A bordered girth passes under the front of the saddle-cloth and the horse also wears a bordered neck strap. The tail is bound, there is a poll-knot, and there may be a phalera on the forehead. Flavian.

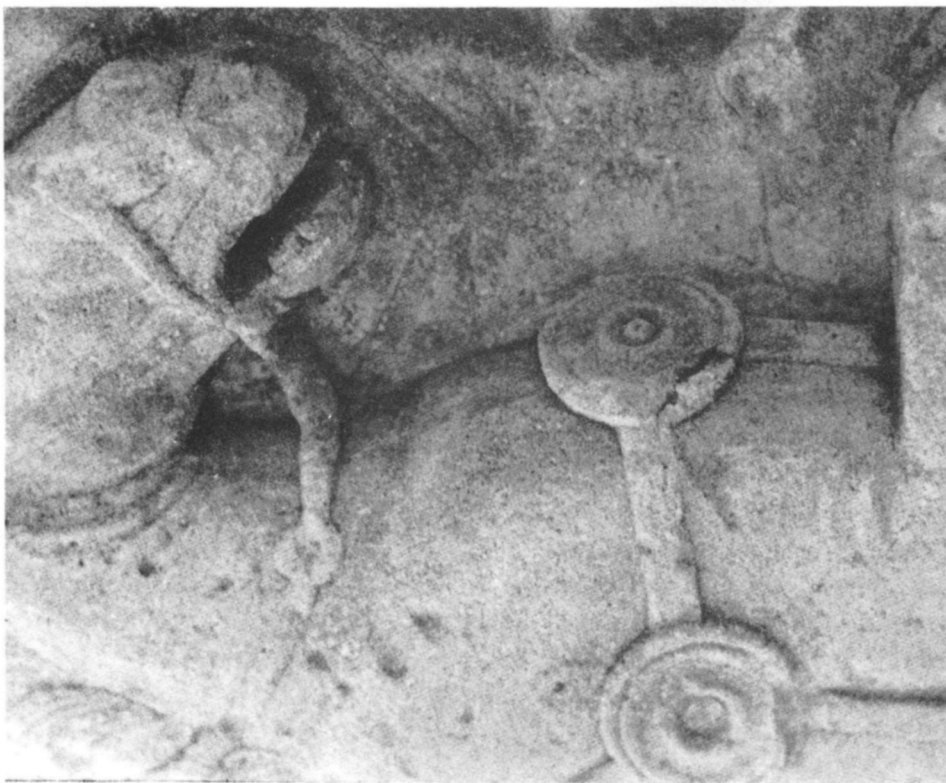
22. C. Romanus Capito (Reiter, ala Noricorum; Figs.16-18)**37**

Mainz

Three phalera junctions are visible on this tombstone, a single haunch and two shoulder straps passing to the saddle over the fringeless shabracque (Fig.17). There are no pendants other than the two pendant straps. A set of triplet straps hangs from the rear saddle pommel. A girth strap passes beneath the front of the horse's belly and under the saddle-cloth. At the breast junction, a martingale descends from the phalera (Fig.18). There is a ring in the reins and the tail appears to be bound. Neronian.



**Fig.17:** C. Romanus Capito Detail of haunch junction and tail binding.



**Fig.17:** C. Romanus Capito Detail of breast junction.

23. Abaius (Reiter, ala Picentiana)<sup>38</sup>

Mainz

Enough of this fragmentary stone survives to show that it had phalera junctions, decorated with rosettes. The haunch junction has two straps which appear to unite before passing to the saddle. There are no pendants, but a pendant strap survives. There is a fringed saddle-cloth, under which a bordered girth strap passes. The tail may be bound. Flavian.

24. Unknown (Reiter, unit unknown)<sup>39</sup>

Mainz

This fragment of a tombstone has a phalera junction at the haunch, from which a single strap passes up to the pommeled saddle, passing over a shabracque. Triplet straps are in evidence suspended from the rear of the saddle. Claudio-Neronian.

25. Leubius (Reiter, ala Sebosiana)<sup>40</sup>

Worms

This horse has phalera junctions, the discs themselves being adorned with rosettes. A single haunch strap is depicted, but it is not possible to tell how many there are at the shoulder, since this is obscured by the rider's thigh; all harness straps are bordered. There is a lunula on the breast and there are pendant straps at the junctions. The pommeled saddle is shown, but there are only light traces of the saddle-cloth (a possible rear edge). There is a girth strap present and there is a ring in the reins. Claudio-Neronian.

26. Q. Carminius Ingenus (Reiter, ala Hispanorum)<sup>41</sup>

Worms

The junctions are of the phalera type, being decorated with rosettes. There are two shoulder straps, but those from the haunch junction are obscured by the sword. Both shoulder straps pass under the front saddle pommel, which is decorated with a border, as is that at the rear. There are no pendants other than the usual pendant straps. There is no sign of a saddle-cloth or girth. There is another phalera at the breast junction and a martingale is clearly visible. There is a small phalera at the bridle junction and another one in the centre of the animal's forehead, on the browband. The tail of the horse is bound. Claudio-Neronian.

27. Licinus (Reiter, ala I Hispanorum)<sup>43</sup>

Worms

This horse has phalera junctions, with a single haunch strap and bifurcating shoulder straps. There are pendant straps, but no pendants. The pommeled saddle sits on a saddle-cloth. There is a ring in the reins and a small phalera on the bridle, whilst the tail of the horse is bound. Tiberio-Claudian.

28. Togitio (Reiter, unit unknown)<sup>43</sup>

Mannheim

Phalera junctions (decorated with rosettes) are depicted on this stone at the haunch and shoulder positions. There are two shoulder straps, but only one passing from the haunch junction to the pommeled saddle. There are no pendants apart from the pendant straps and a lunula on the breast. There is no sign of a saddle-cloth or girth. Claudio-Neronian.

29. Albanus (Reiter, ala Asturum)<sup>44</sup>

Chalons-sur-Saône

The horse has three visible phalera junctions (with figured decoration), with bifurcating Straps passing from those at the haunch and shoulder to the pommeled saddle. There are no pendants other than the usual pendant straps. The lower edge of the saddle, which is angular, is visible, but there is apparently no saddle-cloth and one set of triplet straps hangs from the centre of the saddle. The bridle is decorated with small phalerae. Claudio-Neronian.

Whilst the tombstone evidence is by far the most prolific, there are a number of pieces of official sculpture which also present images of horse harness which are worthy of consideration.

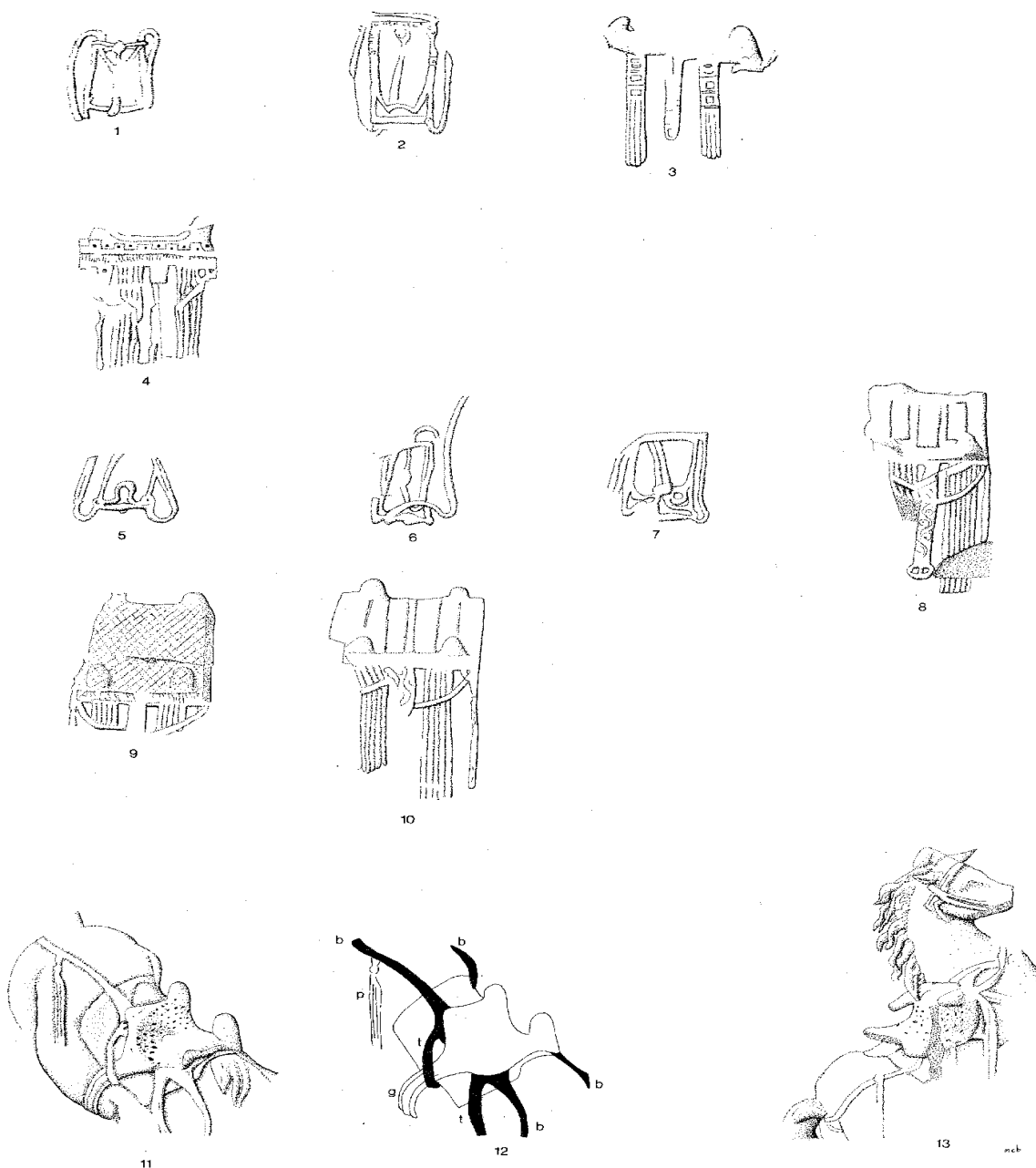
30. Triumphal arch (Fig.19)<sup>45</sup>

Orange

There are three main elements of the arch which contain depictions of harness, namely the static weapons friezes (a), the small battle scenes (b), and the large ones (c).

a. The static weapons friezes survive in considerable detail on the north-east, north-west, and south-east corner faces of the arch.

Amongst the collection of material on the north-east corner face two bridles and a saddle can be distinguished.<sup>46</sup> The left-hand bridle (Fig.19,1) is draped over a shield and is undecorated except for what may be a small phalera at the lower end; whilst headband and cheekpieces can be distinguished, as well as a bit and reins (draped back over the shield), there are additional straps running diagonally across the face, as well as a frontal running down the line of the nose. On the right-hand bridle (Fig.19,2), which is again lying over shield, there appears to be some sort of decoration, possibly in the form of small phalerae. The headband at the top, the cheekpieces, the noseband, the frontal, and the bit are all clearly depicted, as are the reins which pass back over the shield. The saddle (Fig.19,3), situated in the centre right-hand side of the frieze, can clearly be seen to have a curved lower edge, pommels (which are partially obscured by bundle of weapons resting on it), a girth strap terminating in buckle, and two sets of rectangular plates attached (in each case) either to four straps, or strips of material with heavy folds (by analogy with the many belts illustrated, they are more likely to be straps). There are three plates on each, the lower two being border rectangles, whilst the upper ones appear to be decorated with



**Fig.19:** Depictions of harness on arch at Orange and Mausoleum at St. Remy. 1-3: Orange, north-east face; 4: Orange, north-west face; 5-10: Orange, south-east face; 11-13: St. Remy mausoleum; 12b: breast and breeching straps; 12g: girth; 12p: pendant strap; 12t: triplet straps.

crescents. There are no obvious strap elements attached to the saddle.

The north-west face of the monument is quite severely damaged, but it is possible to make out a saddle in the bottom centre of the frieze (Fig.9,4)<sup>47</sup>. This has an interesting design along its lower edge, consisting of cranellation interspersed by dots, above what may be a fringe. A girth hangs down in the centre, and on either side of it are sets of five straps. The right hand set is tangled up with a strap coming from the right hand corner of the saddle, where there is the suggestion of a ring.

The south-east face is the most informative of all and can boast three bridles and three saddles<sup>48</sup>. The bridle in the top right-hand corner (Fig.19,5) is draped across a shield, behind which the reins disappear; the bit appears to be looped. A further bridle is to be found in the centre left of the frieze (Fig.19,6), and cheekpieces, bit, and reins can be distinguished. The third bridle (Fig.19,7), just to the right and below the first, is partially hidden by a shield and a saddle. Cheekpieces, headband, and bit are certainly depicted, but it is not clear whether reins or a frontal are intended in the centre of the bridle. The three saddles are symmetrically arranged, one on either side in the centre, and one at the bottom centre of the frieze. The left-hand example (Fig.19,8) appears to have some sort of panelling depicted on the saddle itself; the pommels have suffered damage. There is a girth strap hanging from the centre, terminating in a buckle, and decorated with a voluted pattern. To the left side of this there are at least five straps, with a further six to the right. A pair of straps hang from the right hand corner, one vertically, the other caught up with the right-hand group of straps. The left hand set of straps also appear to have another strap entangled with them. The central saddle (Fig.19,9) has very pronounced pommels and a lozenge pattern, on its surface (possibly indicative of quilting?) and, unlike the other saddles on the friezes, is taller than it is broad and has a straight lower edge. A central girth strap and two groups of straps (five in each case) hang from it, as do two straps from each of the two lower corners. The third saddle (Fig.19,10), on the right-hand side, has similar panelling on it to the first and is pommeled. The girth is hanging behind a shield above which the saddle appears to be suspended. Two sets of five straps hang on either side of it; the left hand set is caught up with a strap (possibly the same one that is draped over the shield nearby), whilst two straps descend from the right-hand corner of the saddle, where there is a ring.

b. The small battle scenes that concern us involve Roman cavalrymen attacking barbarian foot warriors. On the north facade, there are two such scenes, one in either corner. In the north-east example,<sup>49</sup> a simple ring junction at the shoulder of the horse can be discerned, from which a pendant strap (with four horizontal divisions) hangs. The bit and reins are visible, but the horse's head is too damaged to preserve any other details of the bridle. At the north-west corner,<sup>50</sup> a breast strap that broadens to a point is all that can be seen.

The south-west corner scene<sup>51</sup> again features a ring junction, pendant strap, and broadening breast strap, but this time the details of the bridle, bit and reins are quite well preserved. A small phalera appears on the bridle at the junction of the throatlatch, cheekpiece,



headpiece, and browband. The horse on the scene at the south-east corner<sup>52</sup> has small phalerae on the bridle (one at the side and one in the centre of the browband). A girth is also clearly visible beneath the belly of the horse.

c). There are two large battle scenes, on the north and south faces of the arch.

There are at least eight horses in the south frieze which are Roman.<sup>53</sup> They wear a simple harness consisting of a breast strap that broadens to a point at the centre of the animal's chest, with ring junctions at the shoulder and haunch positions, from which pendant straps hang. The fallen horse in the bottom left-hand corner shows off the harness, with the bordered saddle-cloth and girth, to advantage. The other fallen horse, in the bottom centre right of the frieze, also has a ring junction at the haunch with associated pendant strap, as well as decorated breeching and a possible fringed saddle-cloth.

The north frieze<sup>54</sup> has ten horses on it and they display the same type of harness. One horse, at the extreme left-hand edge of the scene, is particularly clear; apart from ring junctions and pendant straps, a fringed saddle-cloth and girth are visible. As a rule, these two battle scenes do not include representations of the saddle pommels, but a horse in the top right centre is an exception to this. Tiberian.

### 31. Mausoleum (Fig.19)<sup>55</sup> Saint-Rémy-de-Provence

The friezes on the base of the mausoleum at Glanum include a number of depictions of horses.

On the north face of the monument,<sup>56</sup> six horses are depicted -five mounted and one fallen. The mounted figures show only a minimal amount of detail, although the fact that some of them appear to have poll-knots is noteworthy. Simple breast straps (or breast bands?) are attached to bordered rectangular saddle-cloths. The fallen, riderless horse (Fig.19,11), on the other hand, is extremely informative.<sup>57</sup> The pommeled saddle, the surface of which is decorated with dots, sits on a small rectangular saddle-cloth and is secured by a girth which passes over the blanket. Straps hang down vertically (bearing in mind that the horse is kneeling) from the two visible corners of the saddle, whilst breeching can be seen passing round the rump of the horse and fastening to the rear corners. Likewise, a probable breast strap is attached to the visible front corner of the saddle. A pendant strap hangs on the haunch of the animal.

Another mounted figure appears on the east face,<sup>58</sup> but this has a similar simplistic harness compared to the previous examples. The south face, however, has another riderless horse (Fig.19,13) at the extreme left-hand side which again presents a detailed picture of harness.<sup>59</sup> A decorated pommeled saddle is clearly shown, resting on a rectangular saddle-cloth. The breeching passes back from the corner of the saddle and under the tail of the horse. There appears to be a small phalera junction at the haunch, from which a pendant strap hangs. The precise arrangement of straps at the front is difficult to interpret, but there would appear to be a set of triplet straps hanging down from the front

pommel, as well as the breast strap.

### 32. Tropaeum Traiani<sup>60</sup>

Adamklissi

There are very few representations of cavalry on this monument and their precise interpretation is open to some doubt. Metope I shows a horse with breeching and breast band but no junctions. The breastband broadens to a point at the chest, once again, but there is a breast strap with eight phalerae and a lunula at the centre of the breast. The breeching is decorated with a series of ten pendants, in the form of vertical strips with bulbous terminals. The horse wears a saddle-cloth, under which the breeching is passing horizontally. The animal also appears to have a neck strap. The detail of the bridle is damaged, but there may be a small phalera at the side junction. Metope II is virtually identical to I, and the harness originally depicted on Metope IV would appear to be the same again. The horse on the breastplate of the trophy is also similarly equipped. Trajanic.

### 33. Trajan's Column<sup>61</sup>

Rome

Amongst the 82 Roman horses shown on Trajan's Column, there are four varieties of harness arrangement. In all cases, harness straps pass under shabracques/saddle cloths. Pendants are usually trefoil designs, except at the breast, where a lunula is sometimes depicted. No evidence of martingales being worn can be detected (cf. scene LXXIV). Triplet straps range from quite detailed examples with terminals, through to 'folds' in the edge of the saddle cloth.

1. A small saddle cloth (with zig-zag edges) over a larger one with a fringed border, seen in scenes XXIV, XXXVI, XXXVII, XLIX, LXXXIX, XCVI(?), CII, and CIV(?). In scene XXIV, this is combined with a neck strap band. The horse in CIV also has a neck pendant strap with trefoil terminal, as do those in CII.
2. Only one fringed saddle cloth, but also exhibiting pendant straps. This is known only in scene XXI and a neckband is also evident.
3. A single long saddle cloth with triplet straps and a fringed lower edge. It is evident in scenes XXXVIII, XLII, LVII, LVIII, CXLII, CXLV. One example of a pendant strap can be seen in scene CXLII.
4. The final variety is shown on scene LXXXIX and clearly depicts the harness bifurcating from the haunch and shoulder area. The saddle cloth is long and appears to have no decoration. Neck straps with pendant terminals are evident.

As well as the sculptural evidence, there are a few representations of horses and their harness executed in pipeclay. These may be cult images, possibly associated with Epona, but their similarity to the tombstone evidence in certain details is impressive.<sup>62</sup> Trajanic.

### 34. Pipeclay figurine<sup>63</sup>

Unprovenanced

Although no breeching is visible on this figure, the pommeled saddle is very clearly depicted, as are the triplet straps hanging from the horns. A band passes around the neck from the front of the saddle

and may represent either the breast straps or a neck band.

35. Pipeclay figurine<sup>64</sup>

Brimeux

The horse depicted by this figurine is equipped with ring junctions on the haunch and shoulder. A breeching strap appears to pass the haunch junction, whilst two haunch straps can be discerned passing towards the pommeled saddle. The shoulder straps are concealed at the front, but the breast strap can be made out. Pendant straps hang from both junctions, whilst triplet straps (five at the front, three at the rear) hang from the pommels of the saddle.

Amongst the other representational evidence of Celto-Roman harness, we may include the Gundestrup cauldron (which probably pre-dates the first century A.D., and one of the decorated helmets from Nawa, which almost certainly post-dates it. Nevertheless, they provide a useful comparison with the strictly contemporary evidence.

36. Silver plated cauldron (Plate E; Fig.20)<sup>65</sup>

Gundestrup

Although it was found in Denmark, there are acknowledged to be clear La Tène affinities in the details of this vessel. There are four horsemen shown and all four horses have identical harness, consisting of a pommeled saddle over a rectangular saddle-cloth, with a set of triplet straps hanging from the rear pommel. There is a phalera at the haunch junction, which is joined to the saddle by a haunch strap and from which lead breeching and a pendant strap. There is also a phalera at the front of the harness, although it is by no means clear whether a shoulder or breast junction is intended; on balance, the former seems more likely. There is likewise a single strap leading to this from the saddle, but there is no pendant strap. The tails are shown with a horizontal pattern inscribed on them, possibly intended to represent full-length binding. It is worth noting that the riders wear spurs, 2nd-1st centuries B.C.?

37. Copper alloy helmet (helmet B)<sup>66</sup>

Nawa

In a battle scene depicted on this helmet, three Roman infantrymen and one mounted figure are pitched against six barbarian foot and two mounted men. It is the mounted Roman figure which concerns us here. He sits astride a rectangular fringed saddle blanket, but no saddle is visible. A breeching strap passes round the animal's hindquarters from beneath the saddle blanket and there is a pendant strap on the haunch (but no visible junction). At the front, a breast strap broadens to a point and there is another pendant strap (also without a junction). Apart from a bridle, the only other straps may be intended as reins, although it may be argued that a neck band is meant to be depicted. All of the straps appear to be studded. Second century A.D.?

In the face of a seemingly contradictory corpus of material, one



mcb

**Fig.20:** Horseman from the Gundestrup cauldron.



**Fig.21:** Relief from tombstone of Rufus. Mannheim Museum.

of the fundamental problems with the representational evidence is knowing what to believe. The quality of depiction ranges from the crude, probably early tombstones (Fig.21), through the detailed later examples, to the fine, classical official sculpture of the city of Rome itself. Comparison of the equipment shown on these various images with material from the archaeological record strongly suggests that the Tiberio-Claudian and Flavian tombstones of the Rhineland were consistently the most accurate representations of Roman cavalry.<sup>67</sup> The Romanus stone (and those like it) and that of Bassus seem to be the highpoint of sculptural representation of horse equipment, and it is not surprising that their harness makes the most sense when viewed from a purely functional standpoint. However, this is very difficult territory - is plausible equipment sufficient evidence for the accuracy of the tombstone?<sup>68</sup>

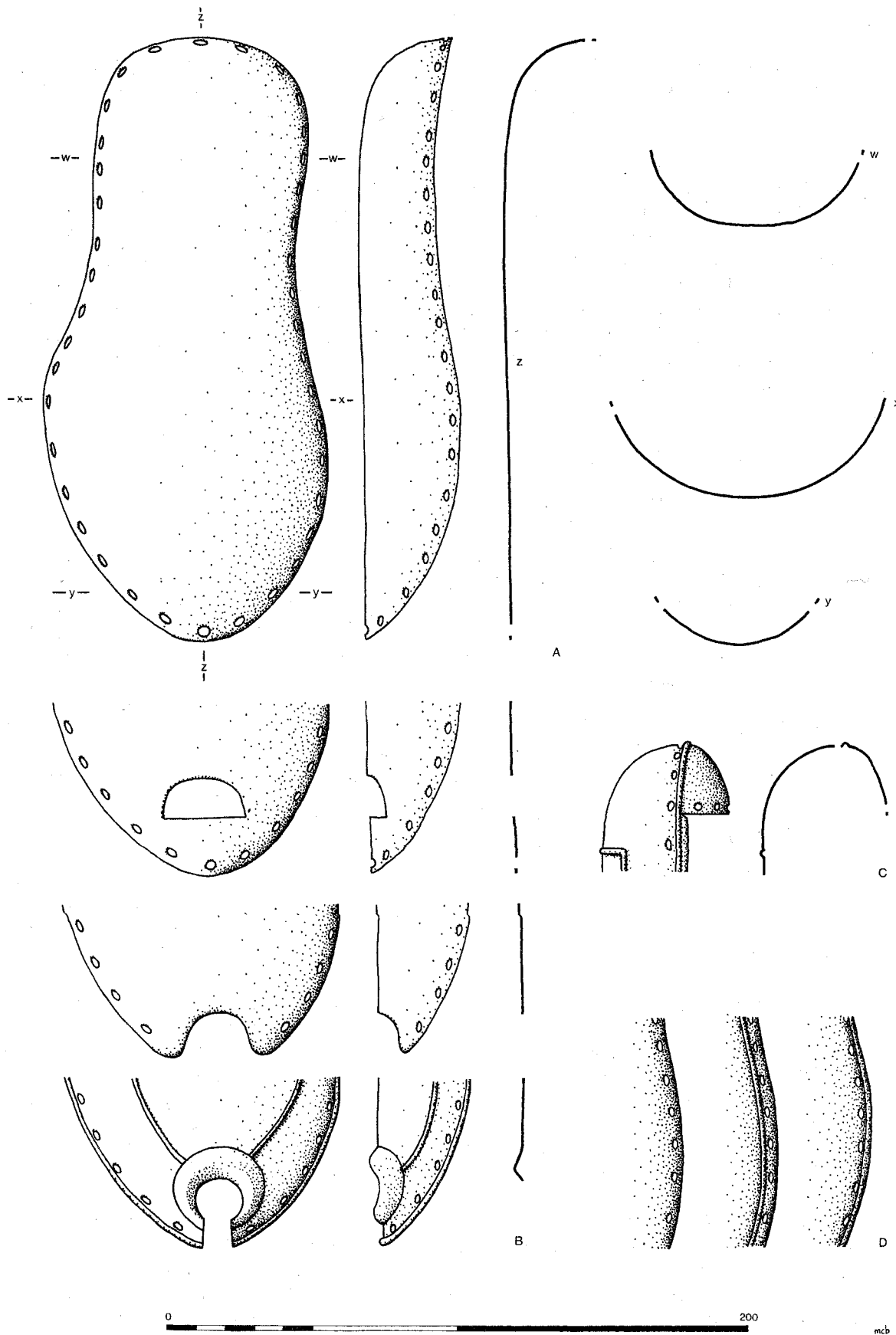
#### THE ARCHAEOLOGICAL EVIDENCE

Saddle horns (Table 1, Figs.22-3; 36)

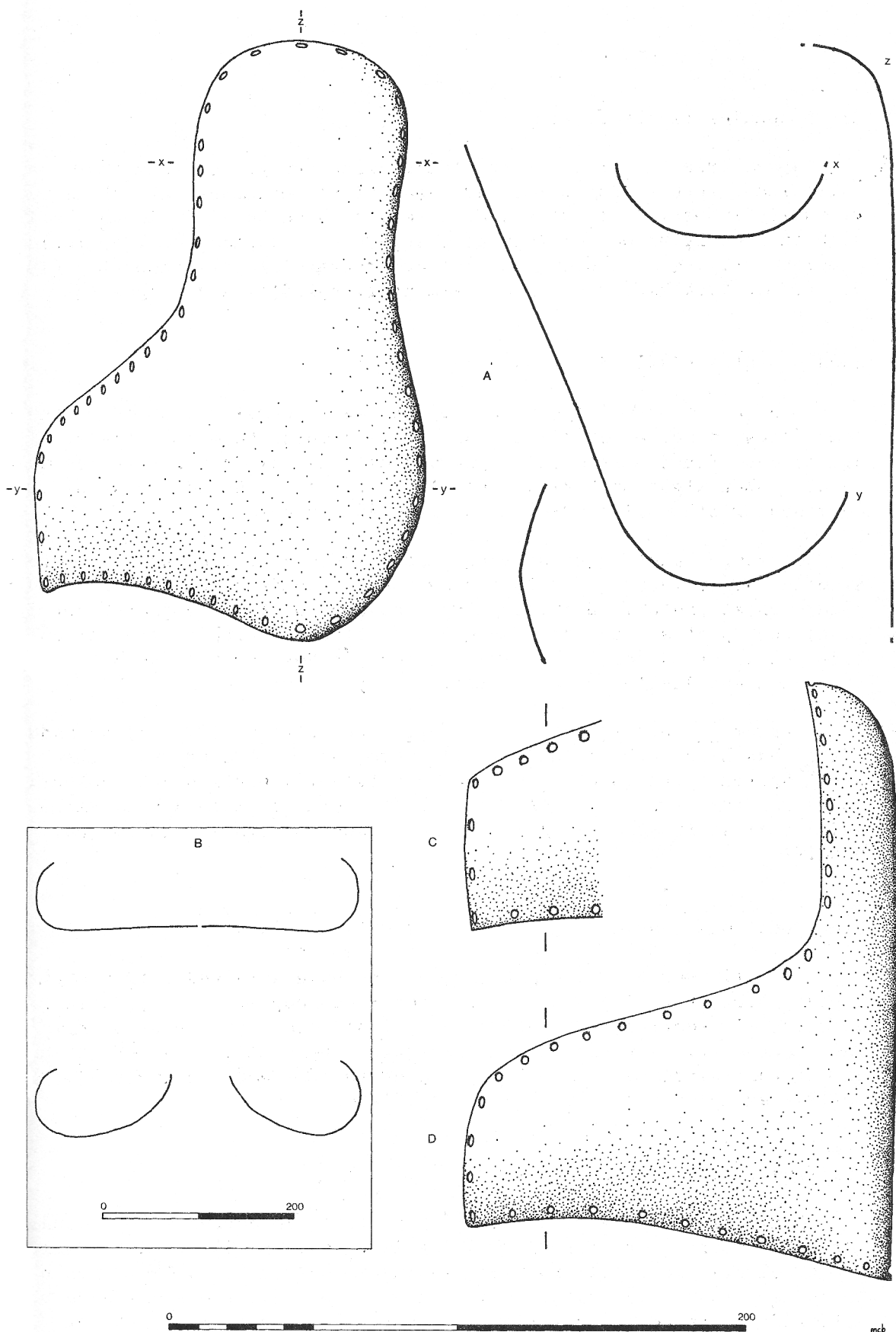
The most tangible archaeological evidence for the Celto-Roman saddle are the shaped horns that are occasionally found. These are made of copper alloy sheet and some retain traces of leather adhering to the outer surface or inner edge. A set of four horns comprises two front and two rear pieces, none of them being interchangeable. The horns from the rear of the saddle have extensions on one side, at the base,<sup>69</sup> whilst those at the front also flare more on one side of the base (but only slightly), in most cases (Figs.22-3).

The set from Pit XXII at Newstead have the numeral 'XV' inscribed punctum on one of the rear pieces, and 'XII' on the other three elements. The piece with 'XV' also has two scratched graffiti on the inside, reading 'SENECIO' and 'CRESCES', whilst the others are just marked 'SENECIONIS', again on the inside. Similarly, one of the Neuß objects has the name 'T. BASSI' punched from the inside and the Moers-Asberg set had a name scratched (and now illegible) on their inner faces.<sup>70</sup>

Examination of the corpus of published examples (as well as some pieces which are not yet fully published) reveals a number of variations upon the basic form. Around the periphery of these fittings are drilled a series of holes; within a set, the spacing of the holes is more or less standard, but it can vary widely between different sets of horns (compare the two sets from Newstead, for example).<sup>71</sup> However, there are further differences besides the spacing of these holes: some pieces have a raised border inside this line of holes (Types 2-4), whilst others possess a semi-circular aperture in the base of the horns (Types 3 and 4). Another major difference is manifested in the shape of the rear pair of horns: the Rottweil set has straight extensions which appear to butt together in the middle of the saddle, but most of the known examples of this type of object have inwardly curving extensions and rounded ends (Fig.23,B), as is the case with both sets of Newstead horns, suggesting that these were not intended to meet.<sup>72</sup> It is also worth noting that some of the Mainz-Weisenau pieces have small 'pockets' at the top (Fig.22,C), which may in fact be indicative of the thickness of the pommel at this point.<sup>73</sup>



**Fig.22:** Typical front saddle horns, showing A: profiles; B: variations on lower opening; C: Weisenau 'pockets' at top of horn; D: three types of edging.



**Fig.23:** Typical rear saddle horns, showing A: profiles of right-hand piece; B: possible variations in shape of rear of saddle; C: square-ended projection; D: round-ended projection.

Girth buckles (Table 2; Fig.36)

Apart from the fact that their size suggests they may have fulfilled some such role, archaeological examples of these are virtually impossible to prove. Most seem to have been of copper alloy with an iron spindle. Some examples appear to have had the loop moulded complete (Types 1-2 & 4), whereas others were clearly composite (Type 3), formed from side pieces, cross-member, spindle, and tongue.<sup>74</sup>

Saddle plates (Table 3, Figs.37-8)

Made of copper alloy, these objects were normally cast.<sup>75</sup> On their rear faces, a series of rivets and strips secured them to straps. The dimensions found in the catalogue suggest that two standard sizes were in use, what might be termed the 'narrow' and 'broad' plates, the commonest widths being 80-89mm and 120-129mm respectively.

Although most plates were cast in one piece, the Castleford examples are unique so far in having their roundels added in copper alloy sheet metal. Silvering was common on these objects, but the Castleford plates also show signs of tinning within the circular recesses intended for the separate bosses.<sup>76</sup> Some pieces, such as those from Neuß and Aislingen, have niello inlay.

Werner's identification of openwork plates (Type 6) as saddle plates has been doubted implicitly by Brouwer, on the grounds that it was inspired by the Doorwerth objects originally published by Holwerda. However, the two types of plate share a similar method of attachment and are close in size, so there is no reason to dismiss them out of hand.<sup>77</sup>

Ring junctions (Table 4)

In all cases where ring junctions have survived from the first century A.D., the ring was a cast piece of copper alloy, sometimes circular in section, but hollow L-sectioned examples are also known.<sup>78</sup> The example from Strasbourg was decorated with niello inlay. Most have an external diameter of 30-50mm and are probably harness junctions, but smaller examples may belong to the bridle or reins.

Phalerae (Table 5, Figs.39-42)

Phalerae were almost invariably cast in copper alloy (usually brass).<sup>79</sup> Where a white metal coating is found, it is usually silver sheet soldered into position and tinning is seldom found.<sup>80</sup> It has been suggested that the loops and rings on the rear faces may have been soldered or brazed in position, rather than cast as part of the original moulding, but this is by no means certain.<sup>81</sup>

It will be apparent from an examination of the catalogue presented here that phalerae may be classified by either profile (i.e.



decorative) or functional criteria.<sup>82</sup> If we begin with the functional characteristics (Figs.41-2), it is evident that a clear pattern can be discerned.

- a) One loop phalerae are fixed directly onto the strap, which passes through the central loop and is fastened by a rivet passing through the centre of the disc. These are usually the smallest phalerae (suspension Type 1a).
- b) Two loop phalerae (Types 2a-f) are found in a number of variants, but are usually associated with a pendant. The first kind (Types 2a, d-e) has two parallel loops through which the strap passes and is fastened in the centre of the disc by a rivet. At the bottom of the reverse face of the disc, a hinge for a pivoted pendant is situated at the centre. The second variety (Type 2b) consists of two converging loops, being closer at the bottom than the top, and joined at the bottom by a short bar, which acts as the hinge for a necked pendant. These normally form the intermediate size of phalera.
- c) Three loop phalerae (Type 3c) usually have one loop on either side, one at the top, and a hinge at the bottom. Although intended for two straps meeting at right-angles, the precise function of this form is debatable and is considered in more detail below. Normally the largest kind of phalera.
- d) Four loop phalerae (Type 3d) are probably similar to the three-loop type and are normally one of the largest varieties, although again their exact manner of use is not immediately obvious.
- e) Three ring phalerae (Types 4a-b) are from shoulder or haunch junctions and are amongst the larger examples, the rings being used for attaching junction loops.
- f) Four ring phalerae (Type 5a) are also from shoulder or haunch junctions and of a similar size range to three-ring examples.
- g) External ring phalerae (Type 6a - usually with four rings equally spaced around the circumference of the disc) are not found very often and are known in both Augustan (Oberaden) and late-first to mid-second century contexts (Newstead).

These functional criteria are totally separate from the decorative regimes found (Figs.39-40) and the two do not appear to be connected in any way. The most common decorative forms of phalera are Types 1 and 2, the basic profile of which is a convex perimeter (narrow on Type 1, broad on Type 2) around a concave centre (broad on Type 1, narrow on Type 2). Amongst the less common decorative forms, are those with very narrow convex perimeters and more-or-less complex concave centres (Type 3), the concave (Type 5), the convex (Type 9), the flat (Types 8 and 12), and the ornately decorated (Type 6). It may be that some of the more bizarre examples, such as Type 6, were from officer's equipment, given the unusual combination of silver and copper, as well as the unique form, but (as always) this is a difficult argument to substantiate.

Pendants (Table 6, Figs.24; 43-9)

As the name indicates, pendants are designed to hang freely from harness. To this end, some means of suspension was necessary, and a variety of forms were utilised by the Romans (Fig.24), but the most common were the hinge and the neck. With a hinged suspension, a pierced lug on the pendant was placed between two similarly pierced lugs on a phalera and a hinge placed through all three (Fig.24,3). The main alternative was to give the pendant a long neck which could be folded forwards or backwards over a bar or ring on the phalera or stud from which it was suspended (Fig.24,2). Although the method of suspension was usually hidden behind the phalera, some forms of pendant which were not suspended in this way developed decorated suspension necks (Fig.24,1).

Pendants were normally cast from copper alloy (brass); the silvered and nielloed ones then having their exterior faces engraved as necessary. The Xanten fittings appear to have had their silvering applied before they were engraved.<sup>83</sup>

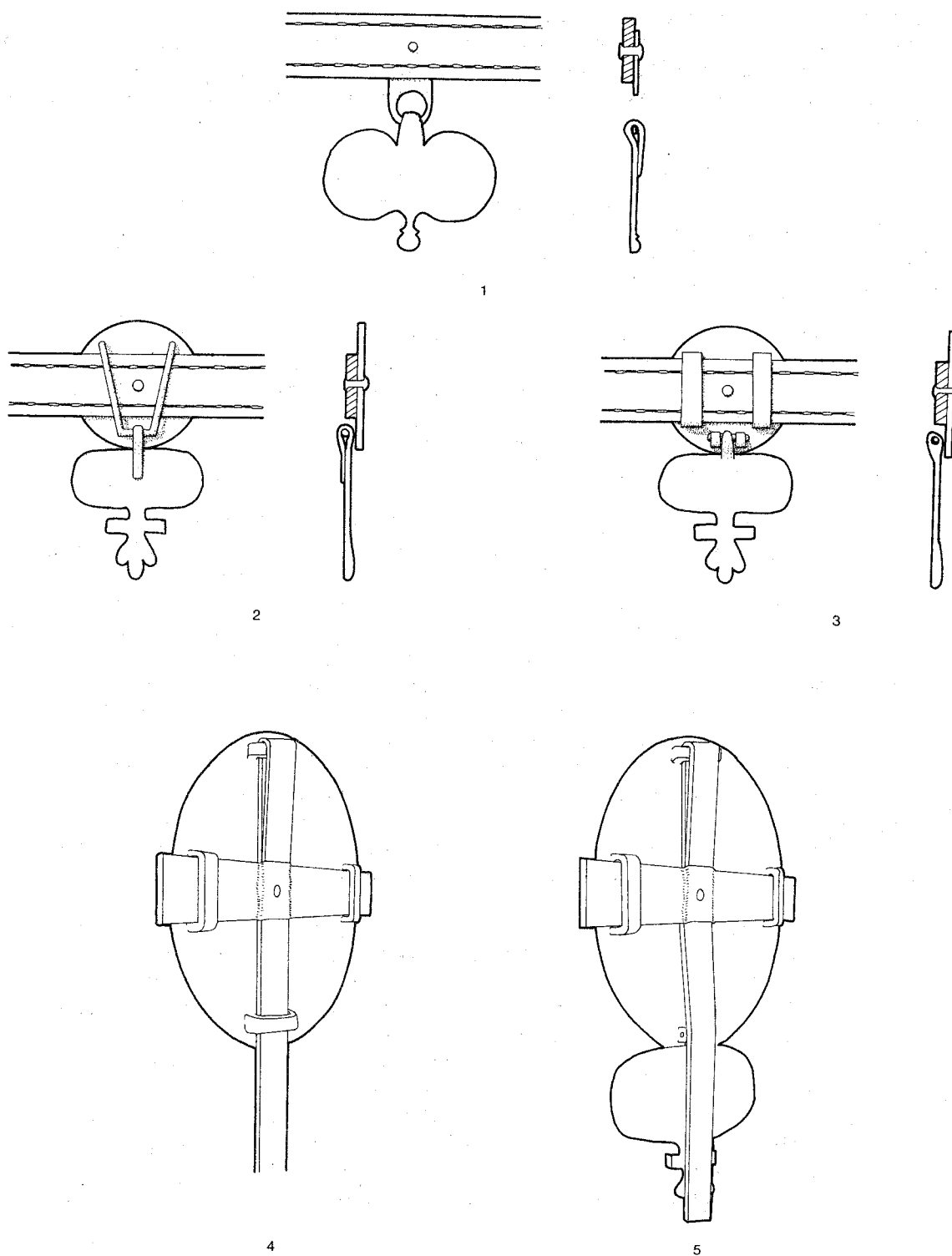
One of the commonest forms of pendant in the first century A.D. was the so-called 'trifid' pendant (Type 1). These were always associated with phalerae<sup>84</sup> and were usually silvered and inlaid with niello. This type is closely linked with the lunula (Type 9) with internal pendants (Type 8), from which it was probably ultimately derived, and it is the type found in the Doorwerth and Xanten hoards. There was a wide range of variations upon the theme, but most versions had a central lobe decorated in the form of a leaf. A common motif is the oakleaf central lobe, flanked by acorn terminals. The Xanten and Doorwerth pieces also exhibit 'eyebrows' and 'noses' (Type 1a) - in fact the similarities between the two collections are quite remarkable and probably point to a common workshop for their manufacture. The inlaid decoration on these pieces is usually based on a theme of viticulture, with vine leaves, tendrils, and bunches of grapes appearing in a variety of more or less stylised forms.<sup>85</sup> This type is found from the Claudian period onwards, but cannot yet be shown to be earlier.<sup>86</sup>

Type 2 pendants have ovoid bodies and, like Type 1 pieces, are normally suspended from phalerae (by hinge or neck), and decorated with silvering and niello inlay (again with themes derived from viticulture). The Canterbury examples are so far unique in being suspended from hinged strap mounts, as well as being decorated with bosses. Like Type 1, these probably date from the Claudian period.<sup>87</sup>

Examples of Type 3 are comparatively rare, but shown to belong to the first century by the example from Doorwerth. They are interesting insofar as most of them incorporate an openwork peltaform terminal. Suspension is usually by a neck.

Type 4 pendants derive their shape from leaves, 4a and 4b directly from vine leaves. Suspension methods vary, and include neck, loop, and rivet.

Teardrop-shaped pendants (Type 5) are extremely common and



**Fig.24:** Methods of pendant suspension and martingale attachment. 1: neck suspension; 2: loop suspension; 3: hinge suspension; 4-5: possible methods of martingale attachment to breast junction.

fulfilled a variety of purposes. Some of the smaller ones formed terminals to 'apron' straps or central pendants in lunulae (Type 9), but the larger examples could be suspended from phalerae, as the finds from Inota show.<sup>88</sup> These normally employed neck suspension, but hinges are also found.

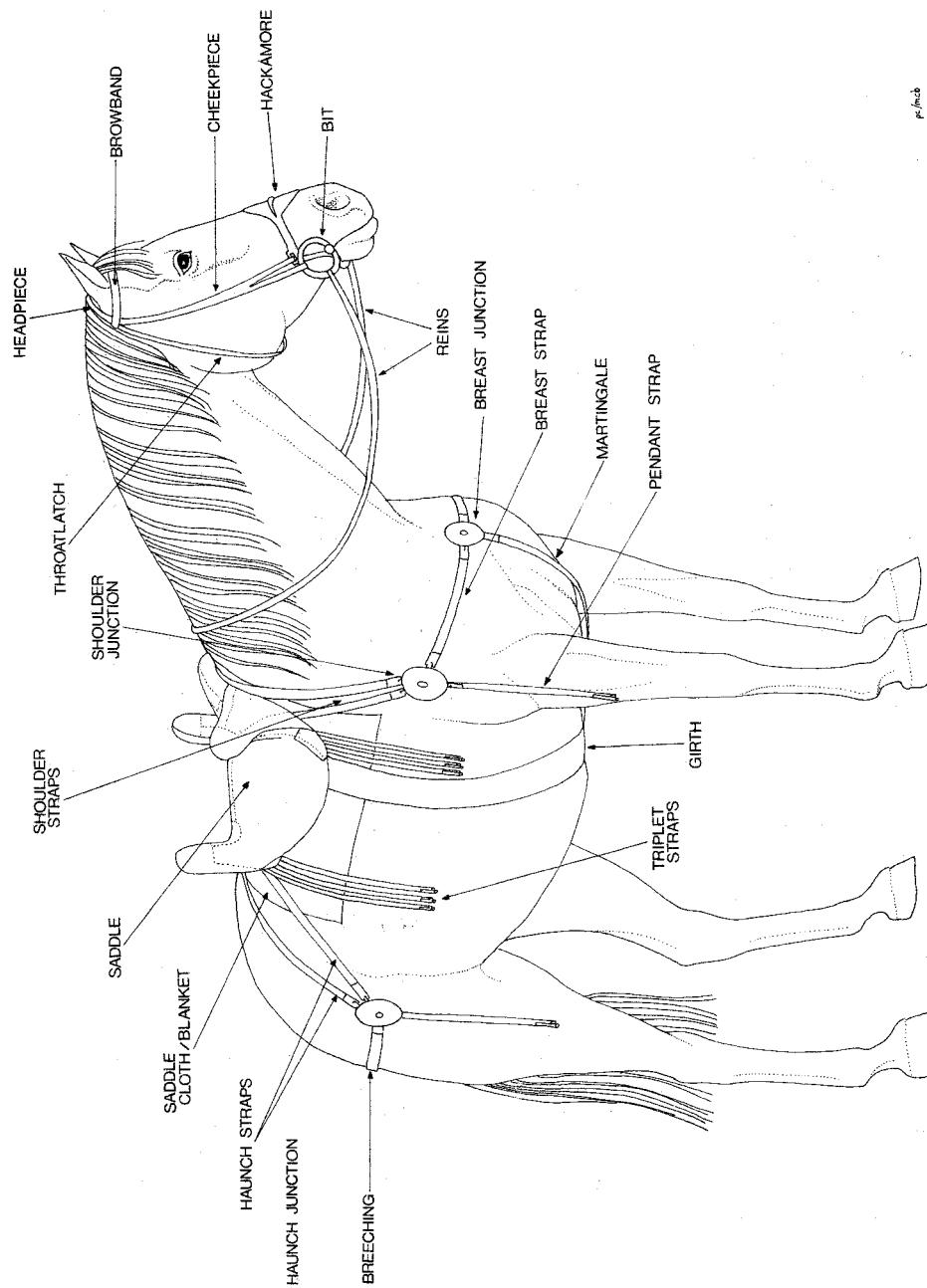
'Bird-headed' or 'winged' pendants (Type 7) are one of the commonest pre-Flavian types, the major forms being the simple 7b and the more elaborate 7a. Tinning seems to be the most frequent form of decoration, but pieces could incorporate punctum patterns. 7a pieces usually have a stylised wolf's head, but some have more naturalistic representations. 7b uses a stylised bird's head, either duck or goose, but again some pieces are more realistic than others. The method of suspension is always by neck, which was passed through a loop (often suspended from a stud) riveted to the harness strap. This type of pendant was popular in the pre-Flavian period (a fact illustrated by their distribution in Britain), but has not so far been found in Augustan or Tiberian contexts.<sup>89</sup>

Lunate pendants (Type 9) come in a wide range of forms and are extremely common. Large, flat forms with a characteristically angular crescent are rare (Types 9a-c & n), whilst the flat crescent with knobbed terminals (Types d-e) is quite frequently found. Well-formed crescents with an angular profile are very distinctive (Type f) and there is little variation in this sub-type. A curved profile is also quite common (Type g). There are a number of exotic variants which are not very common, but amongst the earliest are the boar's tusk pendants (Type s) which are found in both Roman and Celtic contexts. Suspension is normally by means of a neck, but loops are found, as well as the articulated double-hinge of Type 9s. Lunulae are found from the Augustan period through to the second century A.D. in association with cavalry harness.<sup>90</sup> Type 8 pendants are normally found suspended (usually by a neck) inside the arms of a lunula.

Phallic pendants (Types 6 and 10) are very common in Roma-military contexts, but they exhibit a great deal of variety, so much so, that no one subtype predominates amongst Type 10. The basic symbolic elements are a stylised phallus and fist (making the mano fica sign against the Evil Eye) in an upward-curving crescent, from which testes and a further phallus normally hung. It is interesting that these pendants were almost invariably suspended by means of a ring, usually large enough to form a junction. In fact, some pieces are known with junction loops still attached, but none of these are forms of strap mount which we can associate with cavalry, which leads to the question of whether phallic pendants belong with vehicle harness or beasts of burden.<sup>91</sup>

The same is true of Type 6 pendants, most of which have similar loops at the top, and an example from Strasbourg still has its junction-loops attached.<sup>92</sup>

Although there is no evidence that the piece is from cavalry harness, the final type of pendant (Type 11), the lozenge, is included here because of its resemblance to one of the forms of pendant worn by Bassus (above, No.6, and Fig.3).



**Fig.25:** Reconstructed typical Celto-Roman harness with terminology.

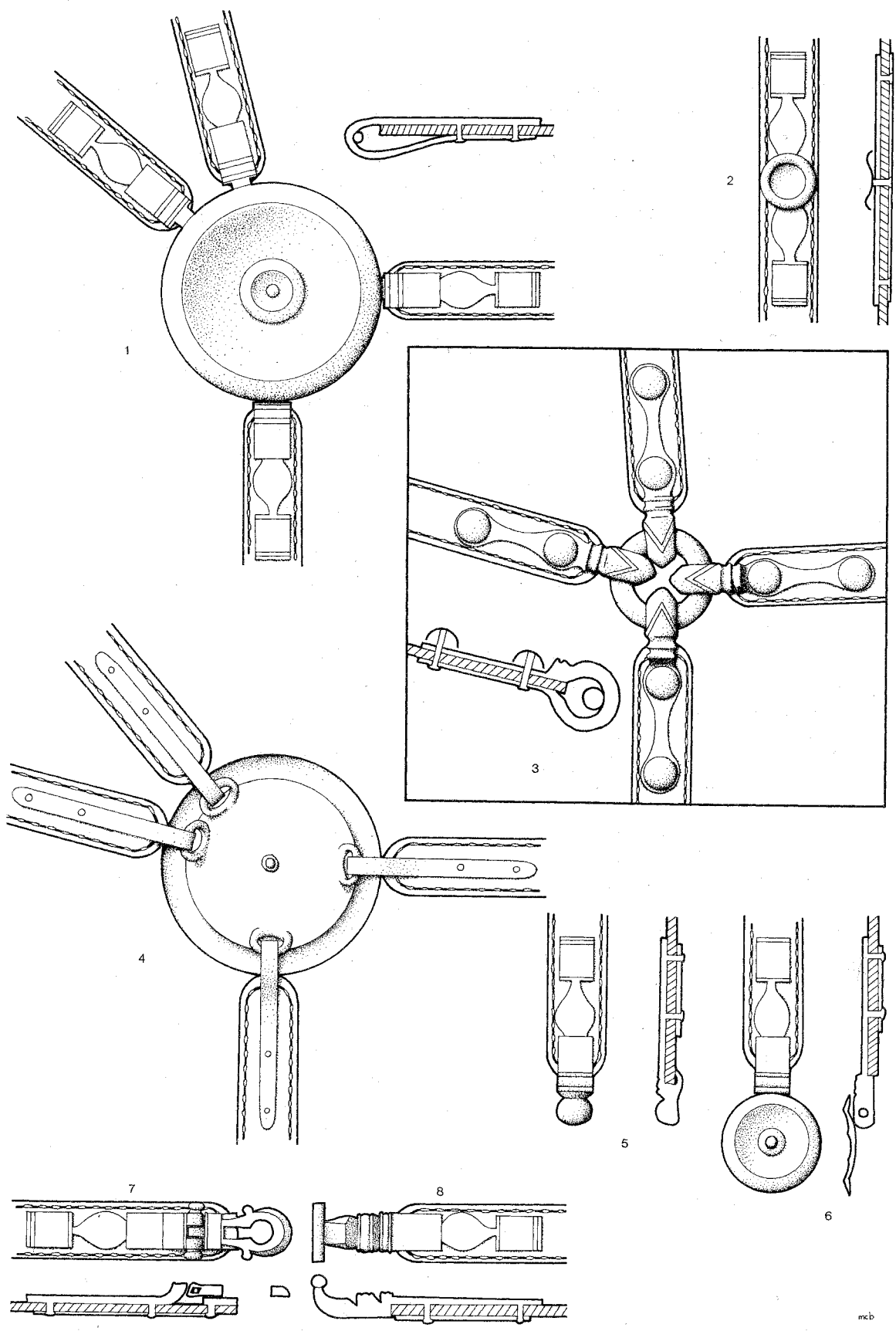
Strap fittings (Figs.26; 50-6)

Roman harness was adorned with a number of different types of fitting, most of which were functional, rather than purely decorative. It is necessary to consider the five main categories as a whole, as well as individually, since each set of harness usually contained examples from each category.

An examination of the published material shows us that there are ten basic stylistic groups of strap fitting, but at least two of these (Types 7 and 10) probably belong to either vehicle or non-military riding harness. In many cases, we do not possess examples of a category for each sub-type, so some interpolation is necessary to reconstruct sets.

Type 1 fittings are those of the 'spectacle' type, normally having a flat figure-of-eight shaped body with two dome-headed rivets securing them to the strap. These are common throughout the two Germanies and Britain and appear to date from Julio-Claudian up to Hadrianic times.<sup>93</sup> Type 2 fittings are similar, but have a slightly moulded profile to the body and a more-or-less stylised volute at one end: their distribution is more limited, being rare in Britain.<sup>94</sup> Type 3, or the 'double-spectacle' fittings, enjoy a very similar distribution to Type 1. They exhibit pairs of rivets securing them to the strap; whilst there are a number of variants, the basic form is very distinctive. Type 4 fittings are the ones with 'moulded' decoration, using themes that include the bordered ovoid and the acorn, and they might also be tinned or silvered and inlaid with niello; these seem to be largely pre-Flavian in their use.<sup>95</sup> Type 5 fittings are rectangular with a broad decorated band at one end and these appear to be in use throughout the first century A.D., but - interestingly - do not include strap mounts. Type 6 are amongst the most familiar, since these are found in the Doorwerth, Xanten, and Fremington Hagg assemblages. This type is flat, although shaped, silvered, and inlaid with niello, using tendril motifs related to those found on Type 1 and 2 pendants and their respective phalerae. Type 6 was probably introduced in the Tiberio-Claudian period.<sup>96</sup> Type 7 is based on the triangle and only junction loops are known for this type, hinting that they may not belong with cavalry harness. Type 8 is the simple rectangle, some sub-types being inlaid, others not. Type 9 are quite rare, so the absence of some categories of fitting may not be significant, but it suggests that they had a very limited distribution. Type 10 includes various rectangular forms and probably belongs to vehicle or pack animal harness, given their crudity and the absence of other categories apart from junction loops.<sup>97</sup>

**Fig.26:** Junctions and strap fittings. 1: phalera junction (from front) with Type 6 junction loops; 2: Type 6 strap mount; 3: ring junction with Type 1 junction loops; 4: phalera junction (from rear); 5: Type 6 strap terminal; 6: Type 6 strap terminal with hinged phalera; 7: Type 6 female strap fastener; 8: Type 6 male strap fastener.



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i. Junction loops (Table 7, Figs.50-1)

The first of our four main types of strap fitting, junction loops, were normally cast from copper alloy (brass). In form, they were simply a decorated upper plate which was bent over on itself and the back element riveted to the front, the bend forming the loop which was attached to the ring junction or phalera. They were not ordinarily detachable from their parent junction.

A clay mould for a Type 1 junction loop has been found in Nijmegen, demonstrating that some at least were cast in the folded position. Some objects from Arlaines, however, which appear to be Type 2 junction loops, have straight loops, whilst retaining their casting flash.<sup>98</sup>

A distinction existed between junction loops intended for use with rings and those that were to be attached to phalerae: ring junction loops had moulded or decorated loops, frequently arched up from the body of the fitting, whereas those for phalerae were unadorned and simply folded back on themselves (as was so with Type 6 and the Newstead Type 5e junction loops). The commonest junction loops in Britain and the Germanies are Types 1c and 1d, with their characteristic (and presumably symbolic) incised triangle on the loop.<sup>99</sup>

Junction loops suffered a number of different forms of damage, almost certainly the result of their manner of use, and equally likely the reason for their high discard rate compared to some other categories of fitting (they are arguably the most common of the harness fittings recovered from the archaeological record).<sup>100</sup> We may classify these faults as follows:

- a) Broken loop. Commonly the loop fractures just below the apex, so that the whole of the rear of the fitting is missing. Probably caused by metal fatigue (a programme of metallographic examination would be useful here) brought about by the fact that this part takes the strain and friction of contact with the junction ring - complete examples show clear signs of wear, due to the fact that the loop was hollow and not shaped to fit the curvature of the ring.
- b) Distorted loop. Here the rear strip and loop are twisted or bent out of place, sometimes straightening out the fitting. This suggests forcible removal from the strap, either accidentally (such as a rivet failing) or deliberately (a wish to change the fitting for some reason).
- c) Body fracture. The body fractures below the loop and first rivet, but above the second - very common on Type 1 and 3 fittings. Possibly due to the strap stretching and causing the inflexible fitting to fail.
- d) Rivet failure. A majority of fittings are found without their rivets, suggesting that this was another important reason for their being discarded. Like c, possibly caused by movement of the strap; this can lead to the whole item being removed from harness. Alternatively, pieces that failed for one of the above reasons would



have had their surviving rivets removed in order to take them off the strap.

More recently, this type of fitting has suffered somewhat at the hands of scholars, who have coined a variety of names for it, but 'junction loop' is the most descriptive of its form and function. They have even been mistaken for baldric fastenings (e.g. 'baldric clip'), as have categories iii and iv below. <sup>101</sup>

ii. Strap terminals (Table 8, Figs.52-3)

These objects were cast in copper alloy (brass) and were used to weight the end of straps. There was usually some provision for butting or crimping the end of the strap itself, and the fitting would then be finished off with a terminal knob. Common forms of damage include the terminal knob breaking off and the distortion or removal of any rivets helping secure the strap.

iii. Male strap fasteners (Table 10, Fig.55)

There are two basic forms for the male half of the 'bar-and-keyhole' type of strap fastening. The simplest of these was a simple bar, curved upwards from the main body of the fitting. A more elaborate version consisted of an upward curving neck, from which two short terminals sprouted on either side, giving it a vaguely zoomorphic appearance.

One of the pieces from Doorwerth was also a junction loop and this is one of the clues to the association of these fittings with cavalry harness,<sup>102</sup> rather than baldrics, but the decorative styles are the clearest indication of their true function, demonstrating their affinity with other types of harness fitting.<sup>103</sup> The Doorwerth piece may indicate that it was customary to twist the female fitting to fit it over the male.<sup>104</sup>

iv. Female strap fasteners (Table 9, Fig.54)

The female 'keyhole' fastener came in three forms, the two most common of which help name it. The 'hinged keyhole' has the actual fastening element hinged to the main body of the fitting, so that the male fitting rested between the body and hinged section of the piece. The second type is not hinged in this way, but is cast in one piece. The third, and least common, is a simple rectangular opening in the fitting.

As might be expected, the hinged element was vulnerable to damage and it and the main body are often found separately.

v. Strap mounts (Table 11, Fig.56)

These are (apparently) the only non-functional elements of harness. They are usually symmetrical longitudinally, typified by the

fact that two-rivet 'spectacle' fittings have three rivets in their strap mount form. Type 6 mounts often feature decorated rivet heads, either domed or dished.<sup>105</sup>

## HARNESS RECONSTRUCTION

### The Saddle

The most important piece of harness for a cavalryman, in order that he should be truly effective in close combat, was the saddle. The outstanding qualities of this were that it should distribute the weight of the rider upon the horse's back without causing it any discomfort, whilst also providing a comfortable and safe seat for the rider.<sup>106</sup> To achieve the first, the saddle has to have a wooden 'tree' (or frame) with padding, whilst the second is accomplished by shaping the seat to fit the rider.<sup>107</sup>

Peter Connolly has reconstructed a Celto-Roman saddle of the first century A.D., based upon the available evidence. This was mainly archaeological (leather saddle covers and copper alloy 'saddle horns'), but was supported by sculptural evidence (taken from tombstones and the St.Rémy mausoleum).<sup>108</sup> The efficacy of this reconstructed saddle was demonstrated in its actual experimental use.

Connolly suggested that the saddle pommels were wooden and that the holes around the edge of some of the saddle horns were for nailing these objects to the pommels. These horns, which were covered with leather, cannot have been attached to the outside of the saddle, since nail holes are not found on surviving leather fragments. Connolly felt that the balance of evidence lay in favour of their being used to shape the pommel on the inside,<sup>109</sup> but the peripheral holes, if indeed used for nailing, would imply that the wooden pommels themselves would have been shaped, thus rendering the horns unnecessary. It might be argued that they were a form of protection for the pommels, protecting thee against damage in battle or mishandling when the saddle was removed from the horse.

However, an alternative explanation for the copper alloy horns may be that the pommels were not wholly wooden. If we accept that the horns were intended to shape the pommels, then it is conceivable that some form of padding was used to form them. A fabric cover, stuffed with horsehair, would be fairly rigid (comparison with recent upholstery techniques confirms this), yet easier to produce than carved wooden pommels; if the horns were then stitched to the outside, these would not only give the pommels the desired shape, but also add an extra degree of rigidity.<sup>110</sup> It is also possible that such padded pommels had a simple wooden core, which would then be attached to the tree, but this would not seem to be essential.

The set of horns from Pit XXII at Newstead include two names on one of the objects, which also has a different numeral punched in it to the others. It is conceivable that one pommel on Senecio's saddle (number XII) had to be replaced with one from Cresces' (number XV); Senecio scratched his name inside, but in the nominative case, not the genitive, as he had done in the other three.<sup>111</sup> The similarity between

these two different rear horns and their implied interchangeability suggests that saddlers used the same basic shape of horn for each saddle they made.<sup>112</sup>

### The Harness

It should by now be apparent that the evidence for the reconstruction of Celto-Roman harness is both archaeological and iconographic, the former providing various artefacts, the latter suggesting ways in which they may have been used. The chief means of fastening the saddle to the horse was provided by the girth strap; this passed under the animal's belly and attached to the saddle on either side. Modern saddles require leather 'flaps' to prevent the buckles which attach the saddle to the girth from chafing either horse or rider, so it is reasonable to expect the Roman system to have included something similar.<sup>113</sup> As we have seen, buckles that are large enough to have served as girth fastenings are known, but it is usually difficult to confirm their identification as such; however, the reliefs on the triumphal arch at Orange depict what are presumably captured Gallic saddles, and these have girth straps (some of which appear to be decorated), each with a single large buckle.<sup>114</sup> Girth straps are shown on some tombstones, although usually without a buckle.<sup>115</sup> Surviving buckles suggest a width of between 50mm and 60mm for the girth strap itself.<sup>116</sup>

The girth, however, serves only to hold the saddle onto the horse, but it cannot prevent it from moving backwards or forwards on the animal's back, and it is for this reason that modern horse equipment may include the 'breastplate' and 'crupper'.<sup>117</sup> The breastplate fastens to the saddle and passes around the front of the animal, thus preventing the saddle from slipping backwards. The crupper, on the other hand, passes under the horse's tail and prevents the saddle moving forwards. Thus the three elements, girth, breastplate, and crupper, serve to keep the saddle firmly in place and provide a firm seat for the rider. In modern harness, the girth may be connected to the breastplate by means of a 'martingale', which may also be connected to the bridle in some cases.<sup>118</sup>

Roman harness (Fig.25) appears to have used a similar system, although differently constructed. Four important 'junctions' can be discerned from the tombstone evidence, two on the haunches, and two on the shoulders, whilst a fifth is found on the breast on some of the horses.

- a) The breast junction is normally composed of three straps, one passing down to the girth, forming the 'martingale', and one on either side connecting with the shoulder junctions.
- b) The shoulder junction comprised three elements: one strap from the breast junction, one passing towards the saddle, and one forming a pendant strap, the function of which appears to have been purely decorative. In some cases, an additional strap passed between the junction and the saddle.
- c) The haunch junction also comprised either three or four elements

and was a mirror image of the shoulder assembly: one strap passing around the horse's rear to attach to the other haunch junction, one attaching to the saddle D-rings, and one forming another pendant strap. A fourth strap might pass to the saddle.

Together, a) and b) are equivalent to the breastplate, whilst c) is the Romano-Celtic prototype of the crupper. This arrangement, suggested by detailed examination of tombstones, is apparently confirmed by the archaeological evidence.

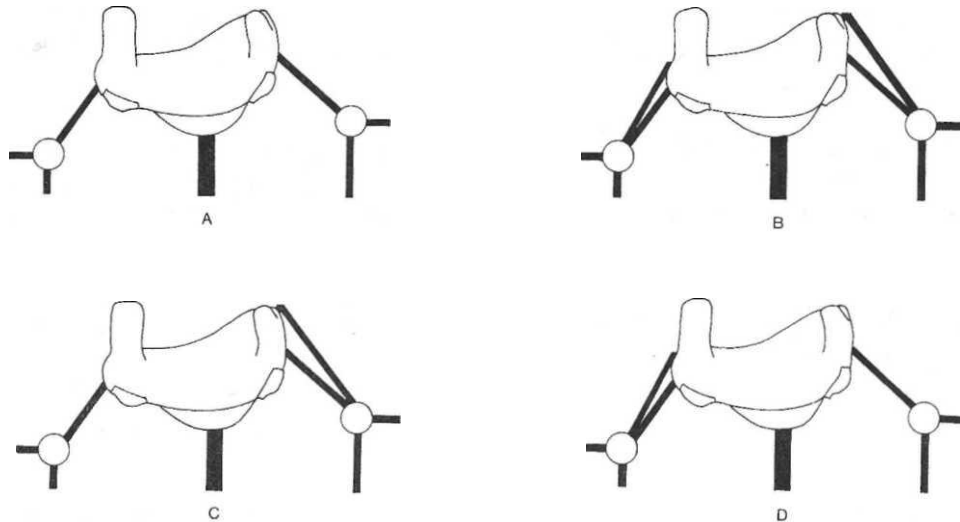
With the exception of a few mineralised pieces on the rear of some of the Xanten phalerae,<sup>119</sup> there are no recognised examples of harness straps surviving, possibly because the leather was oiled rather than tanned.<sup>120</sup> These show the strap to have been 20mm broad with a double row of stitching c. 11mm apart. Jenkins thought that the stitching implied double thickness leather,<sup>121</sup> but since cow hide - with a thickness of about 5mm - was probably used, doubling would have proved unnecessary; the stitching would simply help prevent stretching of the straps.<sup>122</sup> These dimensions are confirmed by examining the loops on the rear of phalerae: widths of around 20mm and thickness of about 5mm are found there too. It is possible that straps had rounded ends, which would avoid the problem of the redundant corners of the straps becoming tatty; leather straps with rounded ends (although almost certainly not from horse harness) are known from Vindonissa.<sup>123</sup>

#### Phalerae and rings

Two forms of junction were in use in the first century A.D., the ring and the phalera (Fig.26). Whilst examples of both survive intact, the phalerae frequently preserve rings and loops on their rear faces which show precisely how they were supposed to function within the harness: examples with three and four rings are well-attested from a variety of sites. Similarly, ring junctions survive with varying numbers of junction loops attached, and these can be compared with the evidence offered by the phalerae.

Rings on phalerae were used for attaching junction loops, as surviving examples demonstrate. Loops, on the other hand, were intended for the straps themselves. Different types of strap mounts were used with the two types of junction, but the distribution of 'phalera-type' and 'ring-type' fittings shows no discernible pattern. Jenkins repeated the idea that phalera-type fittings were associated with awards for merit.<sup>124</sup> However, since phalerae were probably associated with Celtic cavalry before their appearance in Roman service, this argument does not necessarily follow.<sup>125</sup> The frequency of phalera-type fittings in the archaeological record would also seem to militate against this interpretation.

The tombstone evidence implies the existence of a number of variants on the basic harness (Fig.27). In the most commonly attested form, four straps secured the saddle to the harness (which may be termed 'half harness'), but in some cases two additional straps might be found at the front or rear ('three-quarter harness'). A few stones depict the saddle secured by eight straps ('full harness').



**Fig.27:** Types of Celto-Roman harness. A: half harness; B: full harness; C: three-quarter harness (front); D: three-quarter harness (rear).

Careful scrutiny of the best tombstones, in particular those of Bassus and Romanus (above, Nos.6 and 22), shows that (in the case of full harness) both straps from a junction pass under the nearest pommel (Fig.2), but with one slightly above the other. It seems likely that there was an attachment point under each pommel (possibly related to the aperture in the base of some saddle horns) and that one strap was attached to this (whether half, three-quarter, or full harness). When an additional strap was used, it may have crossed over to attach beneath the opposite pommel, although there is no way of proving this.

#### Pendants

Why did Roman military riding harness (and, presumably, its Celtic predecessor) include pendants? It has been suggested that lunulae from Dangstetten may have been a direct introduction by Celtic cavalry. They were certainly the earliest form of first-century pendant. More importantly, they were (and still are) very powerful magical symbols. It is, of course, possible that harness decoration was purely aesthetic in nature, intended to make the cavalryman and his mount look as splendid as possible, but it must be remembered that symbolism played an important part in both Celtic and Roman superstition and religion.<sup>126</sup>

The lunula was symbolic of the moon (and femininity), and the phalera may have been used to represent the sun (and masculinity).<sup>127</sup> This imagery is enhanced in the early pendants by the use of boar's tusks,<sup>128</sup> but it may be that the trifid pendants of later years, although containing a memory of the shape of these early examples, had lost something of the meaning originally attached to them.<sup>129</sup> whatever the case, there seems to be some reason at least for attributing an apotropaic role to the decorative elements of horse harness. In the nineteenth century, heavy-horse harness included horse brasses,

beautifully crafted pieces with significant symbols such as the cross, the sun, a harvest scene, or the crescent moon (or lunula).<sup>130</sup> It has been suggested that these were protecting the horses from malign influences.<sup>131</sup>

Pendants may have been something of a nuisance to a horse, in which case some attempt may have been made to shield the animal from any harmful abrasion. In heavy-horse harness, pendants were usually backed by a shaped piece of leather and it is not inconceivable that similar measures were adopted in Roman harness. Some pendants have rivet holes in their body which may have been used to fasten them to just such a backing, whilst breast phalerae may have used the martingale strap to protect the horse from the pendant (Fig.24).<sup>132</sup> Certainly, the pendants found at Inota do not appear to have been free for much movement.<sup>133</sup>

### The Bridle

The bridle is important, because it is one of the prime means the rider has of controlling his mount, although control by means of his legs will have been essential in combat - protecting himself with a shield on his left side and using a weapon on the right meant that the reins lay on the horse's neck at this crucial stage (and this is usually indicated on the sculptural evidence - see above). In modern equestrian practice, a variety of bits are available to suit the temperament of the animal and the same appears to have been true in the first century A.D., but it is important to remember that in combat, the relationship between animal and rider would have been of paramount importance and, at that point, the type of bit would have been largely irrelevant.<sup>134</sup>

The basic elements of the bridle - cheekpieces, noseband, headband, throatlatch - are all visible in the representational evidence (see above). Some bridles, like that of Primigenius (Fig.9), were decorated with small phalerae, which we may presumably identify with suspension Type 1a. These pieces are usually quite diminutive, but the loop on the rear face nevertheless suggests that, if our identification is correct, the straps of the bridle were of similar (perhaps marginally narrower) proportions to those of the rest of the harness.<sup>135</sup>

It was never the intention of this paper to go into the bridle or bits in any detail, but it seems clear that the range of bit and hackamore types speaks eloquently of the sophistication of the Celtic horsemen.<sup>136</sup>

### The Saddle-Cloth

Roman saddle-cloths or shabracques were apparently fringed in a similar manner to vexilla. The shabracque was worn under the saddle and covered the horse's flanks in most cases; the horses of Sacrius Primigenius and Lucius (above, Nos.10-11) have extremely long examples with a second, shorter cover on top (possibly over the saddle - see above). Some other horses have their saddles covered by long cloths,

but the only sculptural representations of horses being ridden with long saddle-cloths are on Trajan's Column (No.33).

Many aspects of the depiction of cavalry horses on the Column, particularly when compared to Totenmahl sculpture, suggest that they are modelled on the partially-understood equipment of horses in parade gear; the extra-long saddle-cloths are one example, whilst the triplet straps have turned into folds at the front and rear edge of the shabracque.<sup>137</sup> Similarly, the harness proper does not appear to have been understood by the sculptors and is, in many examples, completely impractical.<sup>138</sup>

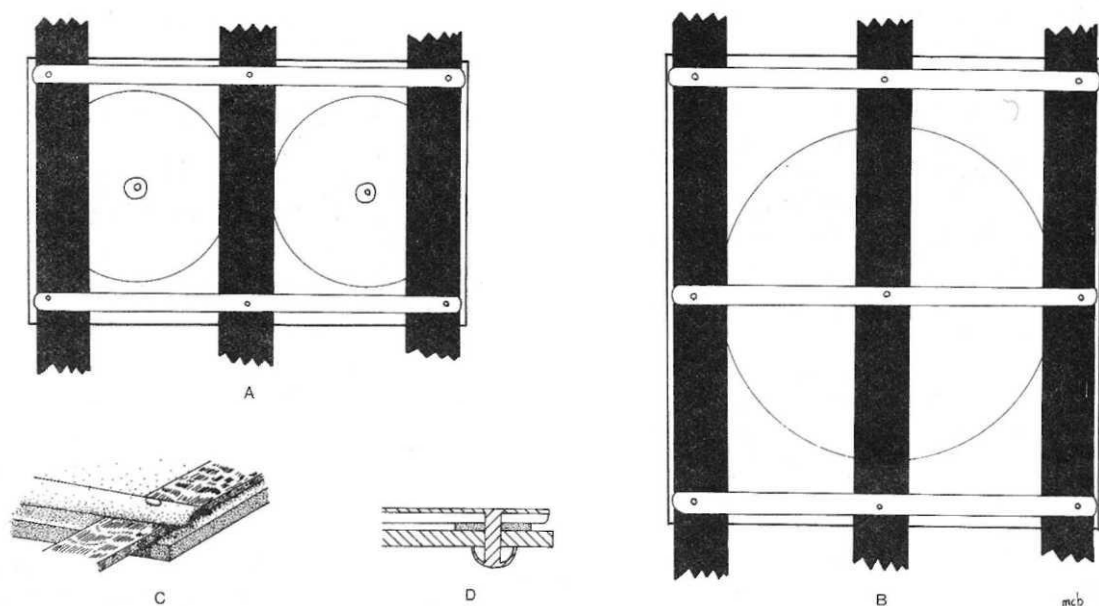
In the case of tombstones which do not have a saddle-cloth, it is likely that it was added in paint. It should be noted that a number of inconsistencies occur on tombstones, when girth and harness straps can be shown passing under or over saddle cloths (see above).

The girth is shown passing beneath the saddle-cloth in so many cases that it is necessary to ask whether it was not in fact fitted over the saddle and girth, but under the harness straps.<sup>139</sup> If this was indeed the case, then there may have been a small under-blanket of some kind.<sup>140</sup>

#### The Triplet Straps

One of the most interesting aspects of the Celto-Roman saddle is the sets of pendant straps frequently shown at the front and rear of the saddle on both sides. These can conveniently be referred to as 'triplet straps', since they are most commonly shown in sets of three. They are found on some tombstones from the Tiberio-Claudian period onwards, but are also to be seen on the Gundestrup Cauldron (above, No. 36 and Fig.20), the arch at Orange (No.30 and Fig.19), and the mausoleum at Saint-Rémy (No.31 and Fig.19), indicating a Celtic origin for them. The tombstones of Primigenius (No.10 and Fig.8) and Lucius (No.11 and Fig.10) depict both front and rear sets, whilst Romanus (No.22 and Fig.16) and Petronius Disacetus (No.20) have only those at the rear. The horse of the centurion T. Calidius Severus also has triplet straps, whilst Andes (No.21) and Cantaber (No.18 and Fig.15) ride horses decked in both sets of straps.<sup>141</sup> They are also depicted on Trajan's Column (No.33).

The Valkenburg and Vechten saddle covers had two sets of semicircular openings (protected by flaps) just below the pommels, which Peter Connolly has shown would have been situated at the lower edge of the saddle.<sup>142</sup> The front set normally had more holes (six or seven) than the back (four) and was consequently wider. The consistency with which tombstones depict three straps, and no other number, probably means that the triplet straps did not pass directly through them. Apertures like this in leatherwork were normally intended for laces; nevertheless, they may have been the means by which the triplet straps were secured to the saddle. The fact that the latter were detachable is suggested by their absence from many depictions, especially those of horses being ridden (unless of course they were concealed beneath the shabracque).



**Fig.28:** Techniques of saddle plate attachment to triplet straps. A: Type 2 plates; B: Type 3 plates; C: detail of method of fastening; D: cross-section.

### Saddle Plates

Any discussion of the triplet straps must be related to a consideration of so-called saddle plates. A series of rectangular decorative plates found in the Doorwerth hoard were identified by Holwerda with the objects depicted on the tombstone of M. Sacrius Primigenius (above, No.10 and Fig.8). Brouwer cast doubt upon his interpretation, but was unable to offer an alternative.<sup>143</sup>

Any reconsideration of the role of these objects must begin with the sculptural evidence. Apart from the well-known stone of Primigenius, that of Lucius (No.11 and Fig.10) may have had similar adornments added in paint and Oluper (No.12 and Fig.11) has two rectangular plates half-way down his triplet straps (see above). More importantly, the Celto-Roman saddles on the arch at Orange (No.30 and Fig.19) have rectangular plates affixed to their triplet straps.<sup>144</sup>

The fact that the sets of triplet straps seem to have come in two widths, if we believe the evidence of the saddles themselves, and that two standard widths of saddle plate are known<sup>145</sup> must be more than coincidence. The matter is surely put beyond reasonable doubt by the examination of the rear faces of saddle plates, where provision for attachment to three straps is the norm (Fig.28).<sup>146</sup>

These objects only appear on Totenmahl tombstones and the arch at Orange, so it may be that their use was purely decorative: a full set would have been extremely heavy and would have presented an unacceptable nuisance to both horse and rider when in motion. Many Totenmahl stones show the whole saddle being covered with a blanket (Figs.6; 13), so it is possible that more pieces have been concealed in this way.



## Other Details

Examination of the tombstones reveals a number of other aspects of military horse equipment that are worth commenting upon. Many of these features could not be reconstructed from the archaeological evidence, so representational evidence comes into its own.

Tail binding occurs quite frequently on Roman funerary sculpture from the provinces, consisting of a binding of material around the base of the tail (Fig.17). Quite apart from presenting a pleasing 'streamer' effect, it would help prevent the animal's tail becoming fouled. This may be inherited from Celtic practice, if the Gundestrup cauldron is to be believed (No.36 and Fig.20).

Neck straps are worn in many cases, again presumably for decorative effect. Phalerae with suspension type 3a were almost certainly intended to accommodate a neck strap. In a few instances, collars or neck bands appear to have been worn under the front harness elements. In the case of Bassus, the band sits under the breast straps, junctions, and pendants, suggesting that it may have been intended to afford the horse some protection from the decorations (Fig.3).

A few of the Totenmahl tombstones show the horses with their manes gathered into knots along the neck, with one large poll-knot between the animals ears. The latter is accompanied by a large phalera apparently seated vertically (Fig.9). The poll-knot also seems to be shown on the Saint-Rémy mausoleum.<sup>147</sup>

## The Horse

Although not directly relevant to the subject matter of this paper, the horses used by the Roman cavalry nevertheless deserve brief consideration, if only because their size would have affected their harness. The discovery of one or more cavalry cemeteries at Krefeld-Gellep has provided data on the size of horses, which can be compared with evidence from other sites, particularly Newstead.<sup>148</sup> It is worth stressing that representational evidence cannot be used reliably to assess the size of Roman horses.<sup>149</sup> The excavated data, on the other hand, seems to suggest an average height of around 14 hands, most specimens being between four and seven years old, but analysis of the Krefeld-Gellep material also revealed a high proportion of male animals, possibly stallions.<sup>150</sup> This last point appears to be reflected on cavalry representations, where examples of ungelded males are known.<sup>151</sup> Cavalrymen appear to have bought their mounts from the army for a nominal fee and it is possible that the same was also true of their harness and other equipment.<sup>152</sup>

## Previous Harness Reconstructions

Surprisingly few serious attempts have been made at reconstructing first century A.D. riding harness, possibly a result of the pervading view that Celto-Roman cavalry were largely ineffectual and so unworthy

of study.<sup>153</sup> Most reconstructions chose to follow sculptural depictions more or less closely, and a significant number of those used Trajan's Column.

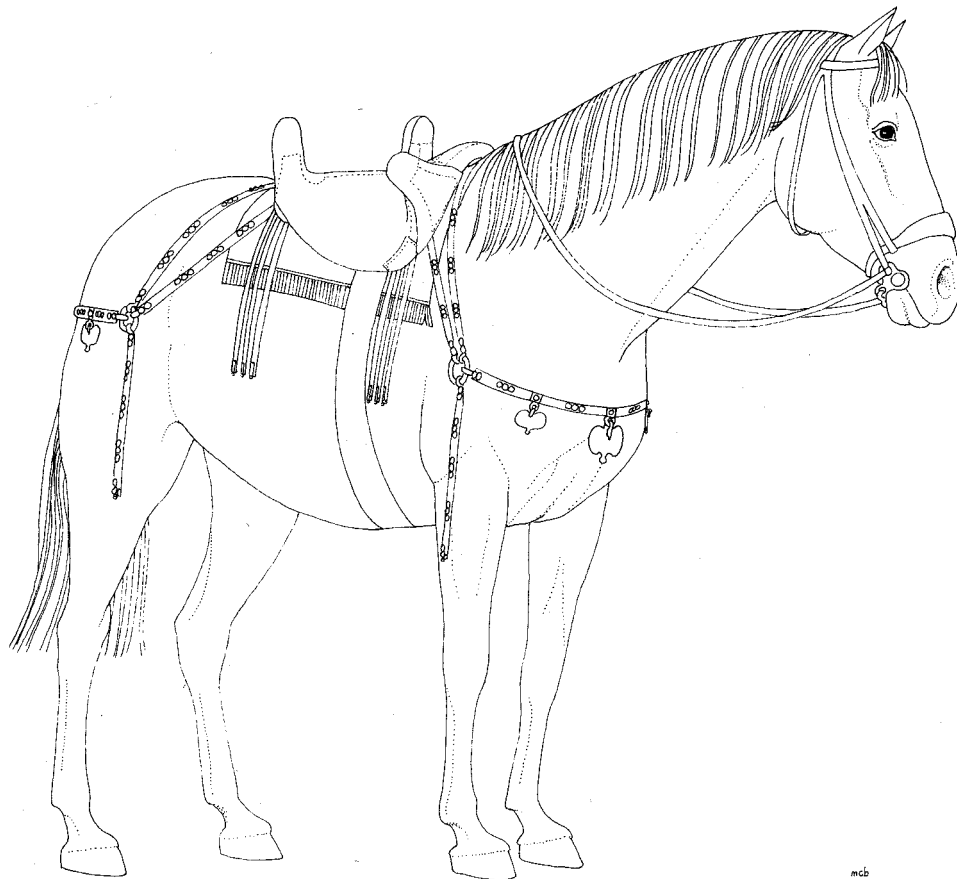
In 1985, Ian Jenkins published fully for the first time the hoard of horse trappings (reputedly from Xanten) in the possession of the British Museum. Believing that this constituted most of the fittings from a single set of harness, Jenkins provided a reconstruction drawing of the harness from which they came. The Xanten material contains only four diagnostic phalerae, A1-4: A1 has two rectangular loops to secure it to the harness, two loops above the strap, and a hinge at the bottom for its pendant (suspension type 3a); A2 and A3 are three-loop phalerae (type 4a); A4 is a four-loop junction, with one loop on one side, two on the other, and one at the bottom (type 5a). Jenkins' reconstruction uses A2 and A3 as the shoulder junctions, with one strap passing horizontally under the saddle blanket; on the other hand, he uses A4 (and its missing partner) for the haunch junctions, with one strap passing horizontally under the blanket, one directed towards the saddle (but again under the blanket), and one forming the breeching.<sup>154</sup> Although some representations show straps apparently joining under the saddle blanket, these are seldom the most reliable. As such, the harness makes no sense, unlike those of Bassus and Romanus, which are perfectly functional.

If the Xanten fittings all belong to one set of harness, then the evidence of the phalerae suggests that it was a three-quarter harness. However, there are problems with interpreting the pieces in the collection as one homogeneous set. The fact that different names are punched on some of the pieces may be of no consequence, but it is interesting that pendant B6 bears the vertical inscription 'VERCUNDI', whilst A1 reads 'T. CAPITONI MARIAN' horizontally. Moreover, the scheme of decoration on the two objects is markedly different.<sup>155</sup> At least three decorative types of small phalera are present in the group,<sup>156</sup> so it is not impossible that the Xanten material, like that from Doorwerth, is a collection of bits of harness, rather than one complete set.<sup>157</sup>

#### THE IDENTIFICATION OF CAVALRY

'Cavalry equipment' is, in itself, a contentious title for this paper. It might be argued that it is not possible to distinguish military horse harness from civilian, or - even if it was military - whether it belonged to 'real' cavalry units (alae), 'mixed' units (cohortes equitatae), legionary cavalry detachments, or mounted officers.<sup>158</sup> It is thus apposite briefly to consider exactly what we know about the Roman horseman and assess the accuracy of the term 'cavalry equipment'.

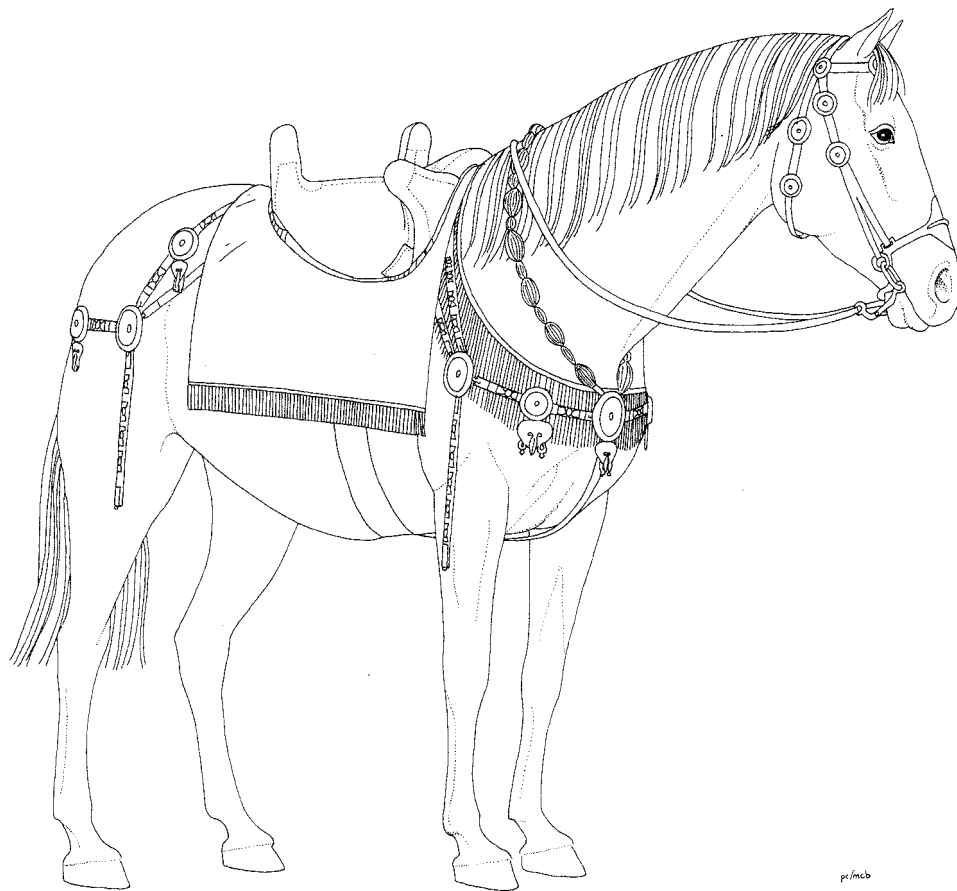
Rome ceased to use citizen cavalry units during the Republican period, and by the time of Caesar's campaigns in Gaul, he was entirely dependent upon Gallic cavalry (supplemented by Germans in some cases).<sup>159</sup> The early imperial legion still contained a mounted contingent, 120 strong according to Josephus, but this appears to have served a communications role and may not even have been a homogeneous body from the organisational point of view.<sup>160</sup> These men were citizens,



**Fig.29:** Reconstruction of typical Tiberio-Claudian harness.

but they were by no means citizen cavalry. Following the example of Caesar, the army of the principate had come to depend upon auxiliary cavalry for mounted support, and the majority of these seem to have been composed of peoples of Indo-European origin.<sup>161</sup> We find Gauls, Spaniards, Germans, and Thracians in first century cavalry and part-mounted units and these form what might loosely be termed the 'Celtic cavalry'.<sup>162</sup> Arrian wrote that, by the time of Hadrian, most of the commands given in cavalry exercises were Celtic in origin<sup>163</sup> and this would seem to support the notion of a strong Celtic element in Roman horsemanship under the principate.

We should not make the mistake of underestimating the cavalry of the period just because they did not have stirrups or use a couched lance.<sup>164</sup> The Celts were clearly accomplished horsemen and Roman cavalry was a formidable weapon if used in the right way, even in the early days of the principate.<sup>165</sup> Figured tombstones of the period show very clearly that an overarm thrust was used with the spear in the right hand, the shield held in the left, and the horse controlled by the rider's thighs (since the reins usually lie loosely upon the neck of the animal). Moreover, thrusting with the spear and swinging with the longsword demanded that the rider should have a firm seat and this was provided by the Celto-Roman saddle. The Celtic cavalryman was, however, primarily a skirmisher, as may be demonstrated by the emphasis

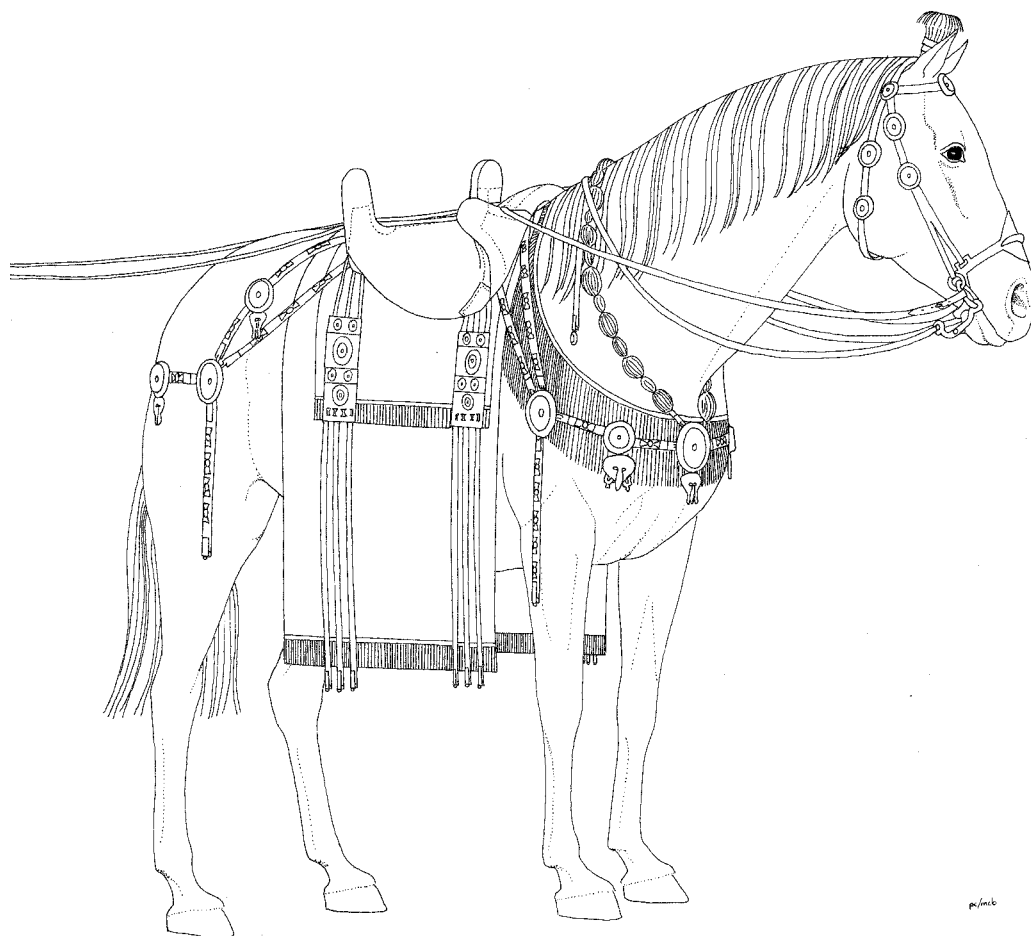


**Fig.30:** Reconstruction of typical Flavian harness.

laid upon missile handling in the manoeuvres described in Arrian's Techne Taktika.<sup>166</sup>

In the early stages, cavalry units were apparently taken into the army from friendly tribes and commanded by tribal nobles. This practice led to units being known by their first commander's name even when they were thoroughly integrated into the Roman army.<sup>167</sup> Even ordinary cavalymen must have been wealthy by the standard of the day, since they would have to have provided their own equipment.<sup>168</sup> Moreover, the relative affluence of cavalymen seems to have continued under Roman control, because the pay of auxiliary cavalry was probably superior to that of their fellow (auxiliary) infantry and it is noteworthy that over 50% of figured military tombstones of the first century A.D. from Britain and the Rhineland show mounted troops of some sort.<sup>169</sup>

Apart from legionary horsemen and the troopers of the alae and cohortes equitatae, officers also used horses. The tombstone of the centurion T. Calidius Severus illustrates this,<sup>170</sup> but the equestrian and senatorial officers of auxiliary and legionary units were likewise mounted,<sup>171</sup> so it is obviously possible that at least some of the surviving 'cavalry' equipment belonged to them.<sup>172</sup> However, the proportions of these compared to troopers in the cavalry units of the army makes it more likely that the material found did belong to the



**Fig.31:** Reconstruction of typical Flavian parade harness, showing horse on long-reins.

cavalry (unless there is some unseen bias affecting the way that material is deposited in the archaeological record, and the evidence would seem to suggest that this was not so).<sup>173</sup>

It is fairly clear that two distinct traditions of niello decoration of military equipment were to be found in the first century A.D. In the first place, belt plates display one particular grammar of ornament (largely botanical in origin),<sup>174</sup> the combination of which appears to have been characteristic of infantry (and this was also picked out, albeit somewhat stylised, by sculptors<sup>175</sup>). In addition, it would seem that these plates were usually tinned.<sup>176</sup> Elements of horse harness, on the other hand, reveal a different decorative tradition, closely linked with viticulture; moreover, these objects are usually silvered, rather than tinned.<sup>177</sup>

It is therefore extremely interesting when items of harness are found that appear to fall into the first of these two traditions. Almost invariably, these pieces do not conform to the most commonly found types of harness fitting.<sup>178</sup> This might be seen as hinting at differentiation between horses in infantry units and the true cavalry of the auxilia, but it is hardly proven.

In the final analysis, it must be the numerical argument that convinces us that most elements of horse harness recovered from the archaeological record belonged to the troopers of the cohortes equitatae and alae. However, this assumption begs the question of whether such material could not also belong to civilian harness.

It seems fairly certain that in both the Celtic and Roman worlds, horse riding was largely the province of the nobility and was frequently associated with war. We have already seen that Celtic nobles formed the backbone of early Imperial cavalry, and we need only note that, in Roman society, the nouveau-riche class were known as equites, or that it was young aristocrats who participated in the 'Trojan Game'.<sup>179</sup> Our evidence for civilian horse-riding in the provinces during the first century A.D. is negligible, so again the numerical argument, plus the military context, suggests that it is unlikely to be 'civilian' horse harness that is normally found.<sup>180</sup>

## CONCLUSION

The pictorial and archaeological evidence all seems to point to the fact that Celto-Roman cavalry (or riding) harness was completely practical and not merely somewhere to hang decorations. Moreover, it seems to confirm that the Romans adopted the equipment of the 'Celtic' cavalry wholesale, since the functional parts of the harness do not change significantly between the time of the Gundestrup cauldron and the tombstone of Bassus, probably well over a century later. However, this is not to deny that change did take place: if decorations were only lunulae and phalerae when Celtic cavalry first saw service in the Imperial army, they soon took on a developmental life of their own, establishing a tradition that was independent of their original Celtic heritage and their new-found allegiances.

It has hopefully been demonstrated that there is little reason for confusion over the attribution of horse equipment recovered from the archaeological record; the majority of it must, logically, have originated with the Celtic cavalry of the alae and cohortes equitatae, and thus it is not misleading to talk of it as 'cavalry equipment.' Moreover, some pointers have been offered towards the identification of trappings from the horses of officers and those belonging to vehicle harness.

## ACKNOWLEDGEMENTS

Since its original composition in 1982, many people have helped me with this study of Roman cavalry equipment. David Kennedy and Phillip Freeman were kind enough to read drafts of the first version, whilst the revised text was read and commented upon by Jon Coulston and Martha Andrews, for which I thank them. Peter Connolly has been the source of much fruitful discussion on the subject of Celto-Roman harness and has shared with me the results of his experiments, as well as redrawing my rather lame Roman horse. I am grateful to the former and present curators of the Hadrian's Wall Museums, Bill Hubbard and Georgina Plowright respectively, for permission to publish the Corbridge finds. Mr Hubbard also produced the illustrations of these objects. John

Hedges and West Yorkshire Archaeological Services permitted me to examine the Castleford material, whilst I have received assistance from Canterbury Archaeological Trust, the Grosvenor Museum Chester, London Museum, Peterborough City Museum, and Wiesbaden Museum, when examining collections of cavalry equipment. Others who have aided me at some point include Lindsay Allason-Jones, Marijke Brouwer, Mike Dobby, Liviu Petculescu, and Pat Southern. This seems the appropriate place to acknowledge the various museums who have permitted me to examine and photograph their cavalry tombstones. The photographs are reproduced here by kind permission of the following museums:

Römisch-Germanisches Museum, Köln (Köln Museum)

Rheinisches Landesmuseum, Bonn (Bonn Museum)

Mittelrheinisches Landesmuseum, Mainz (Mainz Museum)

Städtisches Reiss-Museum, Mannheim (Mannheim Museum).

I should like to thank all of those mentioned above for their help. If there is any merit in this work, then it is surely due to their unstinting efforts, whilst all remaining shortcomings must remain my own responsibility.

## APPENDIX 1: THE PUBLICATION OF FINDS

During the preparation of this article, it has proved necessary to rely very heavily upon published archaeological evidence. Consequently, some of the shortcomings of this corpus have become all too apparent, so it is the intention of this brief appendix to outline some of these and to suggest ways in which the publication of cavalry equipment (and, indirectly, military equipment in general) could be improved.

Many archaeological reports, both old and more recent, suffer from deficiencies in their descriptions of items, particularly in the provision of accurate (or even any) dimensions. In most cases where measurements have been given in this paper, they have had to be provided by measuring illustrations with Vernier callipers and then scaling up the results - clearly not a very satisfactory technique, and yet a majority of small-find reports still ignore vital measurements.<sup>181</sup>

Illustrating cavalry equipment by means of photographs, as was common in earlier reports, introduces complicated distortions due to the imperfection of even the best camera lenses.<sup>182</sup> Although it is possible to correct such deficiencies by means of a computer, such a task seems unnecessarily complex purely in order to obtain the true dimensions of an artefact. Measured archaeological illustrations are better, but even then a proportion of these, where it was possible to check published dimensions with those provided by Vernier callipers (even allowing for rounding errors), proved to be inaccurate. However, these are the examples that are reproduced with the correct reduction: some are wrongly reproduced or labelled and this sort of mistake can only be detected by studying large amounts of material and having some idea of what to expect.<sup>183</sup>

It is common to answer such criticisms by saying that the expert must study the original collections, but this surely negates the whole point of publishing archaeological finds in the first place? It is, moreover, ignoring the fact that it is perfectly possible to produce useful and informative reports on artefacts. Rigorous standards need to be enforced for archaeological small-find illustration and the path has already been marked out by a round-table organised in France,<sup>184</sup> where the principles of publishing a line drawing at 1:1 (with a scale) along with a photograph were established. It also should be added that views from all angles are essential, particularly for the study of phalerae (many were rendered useless for the purposes of the present study because neither the text nor the illustration gave any idea of what lay on the reverse face of the object).<sup>185</sup>

To this end, the following guidelines for the publication of Roma-cavalry equipment may be suggested:

1. Line drawings of the front and reverse face of an object, preferably at 1:1, but in every case to include a drawn scale, rather than a captioned one.<sup>186</sup>
2. Cross-section of the object, particularly useful in the case of phalerae (but also very rare at the moment - most of the examples included in this paper are reconstructed from highlights in the



illustration).<sup>187</sup>

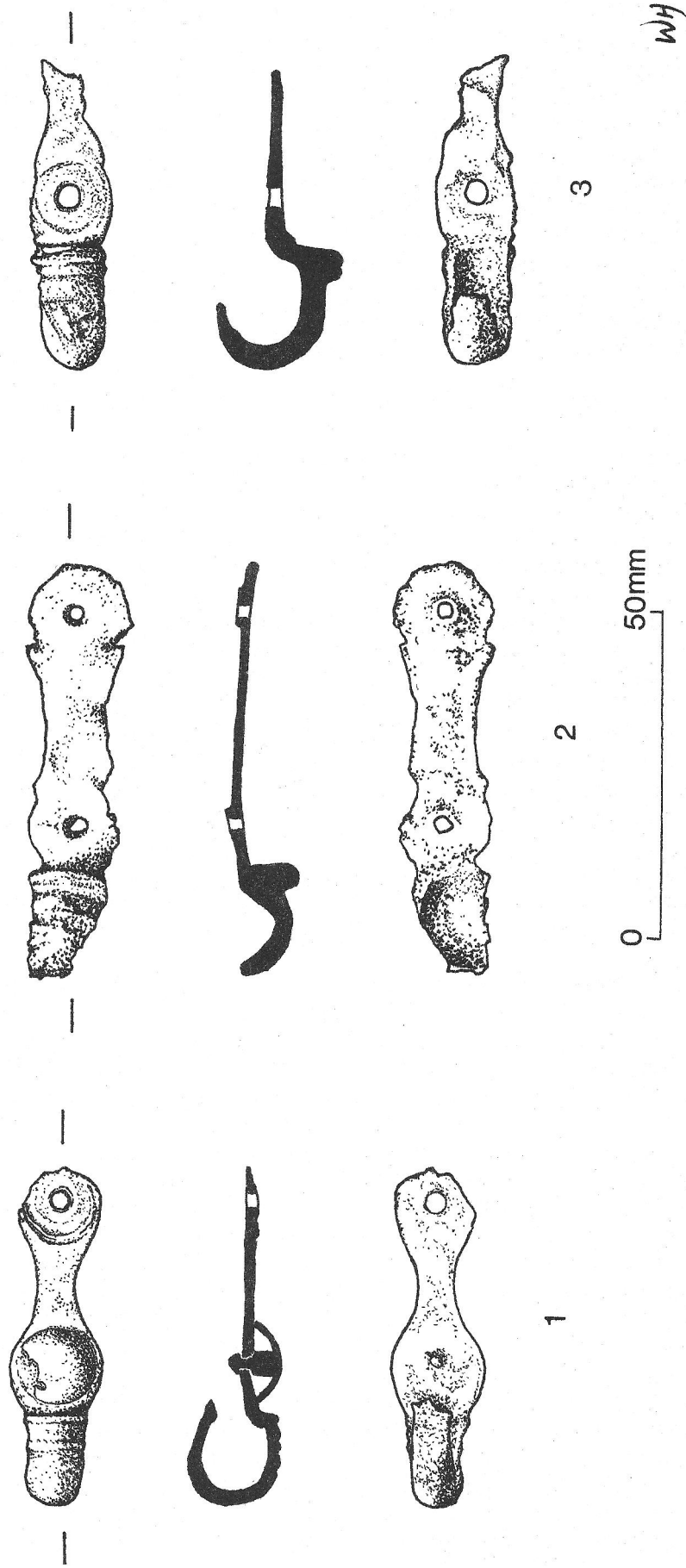
3. A concise textual description of the item, any ancient or modern damage, corrosion, and any decoration remaining.<sup>188</sup>
4. Detailed measurements, which should always include maximum width (or diameter), maximum height, and maximum thickness, but should also include any other important dimensions.
5. In addition to these requirements, a photograph of the object is sometimes useful, if only to gauge how accurately the surface detail has been rendered by the graphic artist.<sup>189</sup>

An example report of this nature is included (below, Appendix 2, although the descriptions are deliberately more elaborate than would be normal); it is to be hoped that these basic standards will at least be considered by archaeologists, for the present lack of any conformity only serves to hinder the study of Roman military horse equipment.

APPENDIX 2: SOME UNPUBLISHED HORSE EQUIPMENT FROM CORBRIDGE,  
NORTHUMBERLAND

Amongst the unpublished and unstratified material from the Roman site at Corbridge now held in the site museum, are a number of pieces of Roman harness equipment. Eight junction loops and one junction phalera of common first or early second century A.D. forms are published here for the first time. No information about the provenance of the objects survives, but they are almost certainly from Corbridge and presumably come from the 1906-14 campaigns of excavation, although no explicit reference is made to any of them in the published reports.

1. 'Spectacle' junction loop (type 1d; inv.no.75.1338). Fig.32. The loop is U-sectioned, with a shallow scarp at the junction with the body of the fitting; this part is decorated with a moulding in the form of a broad relief band bordered by two narrower bands. There are traces of an incised triangle on the loop, with its broadest end against the moulding. The loop shows signs of wear at the apex, but it has fractured where the loop has been bent under to form the return. To judge by the nature of the fracture, it is possible that the damage occurred subsequent to its discovery. The body is the classic figure-of-eight shape with a slightly convex upper face (and flat rear face), although there is slight damage to the end of the object. At the broadest points of the fitting, two flat circular recesses surround the rivet holes. A dome-headed rivet survives in situ in the area nearest the loop, whilst traces of the other rivet head are to be seen around the edges of its recess. The body has been bent up slightly at the loop end, causing the rivet head not to sit quite flush with the surface. Patinated with no areas of bright metal.  
Maximum length: 51mm; maximum width of body: 14mm; maximum width of loop: 7mm; internal diameter of loop: 8mm; height of scarp between loop and body: 2mm; thickness of body: 1.75mm; diameter of rivet head: 11mm; height of rivet head: 5mm; diameter of rivet hole: 3mm
2. 'Spectacle' junction loop (type 1c; inv.no.75.1344). Fig.32. This fitting has a U-sectioned loop with a high scarp between the loop and body, the scarp being surmounted by a moulding consisting of a narrow (rather crude) beaded band with a narrow plain band on either side of it. Corrosion makes it impossible to be certain that an incised triangle is present, or whether there are any traces of wear near the apex, which is the point at which this fitting has fractured. The body is flat and bears no relief decoration; it is in the form of a combination of the figure-of-eight with stylised volutes. The centres of the two circular areas have been pierced (almost certainly punched) from the upper surface, whilst the lower face shows signs of having had the edges of the holes burred. The end of the body nearest the loop has again been bent slightly upwards. Heavily patinated, with severe pitting on the loop itself.  
Maximum length: 63.5mm; maximum width of body: 15mm; maximum width of loop: 10mm; height of scarp between loop and body: 6mm; thickness of body: 1mm; diameter of rivet holes: 2mm
3. 'Spectacle' junction loop (type 1c; inv.no.75.1339). Fig.32. Fitting with a massive U-sectioned loop with a high scarp at the junction with the body, this being surmounted by a similar moulding to that



**Fig.32:** Junction loops from Corbridge (Nos.1-3). Scale 1:1.

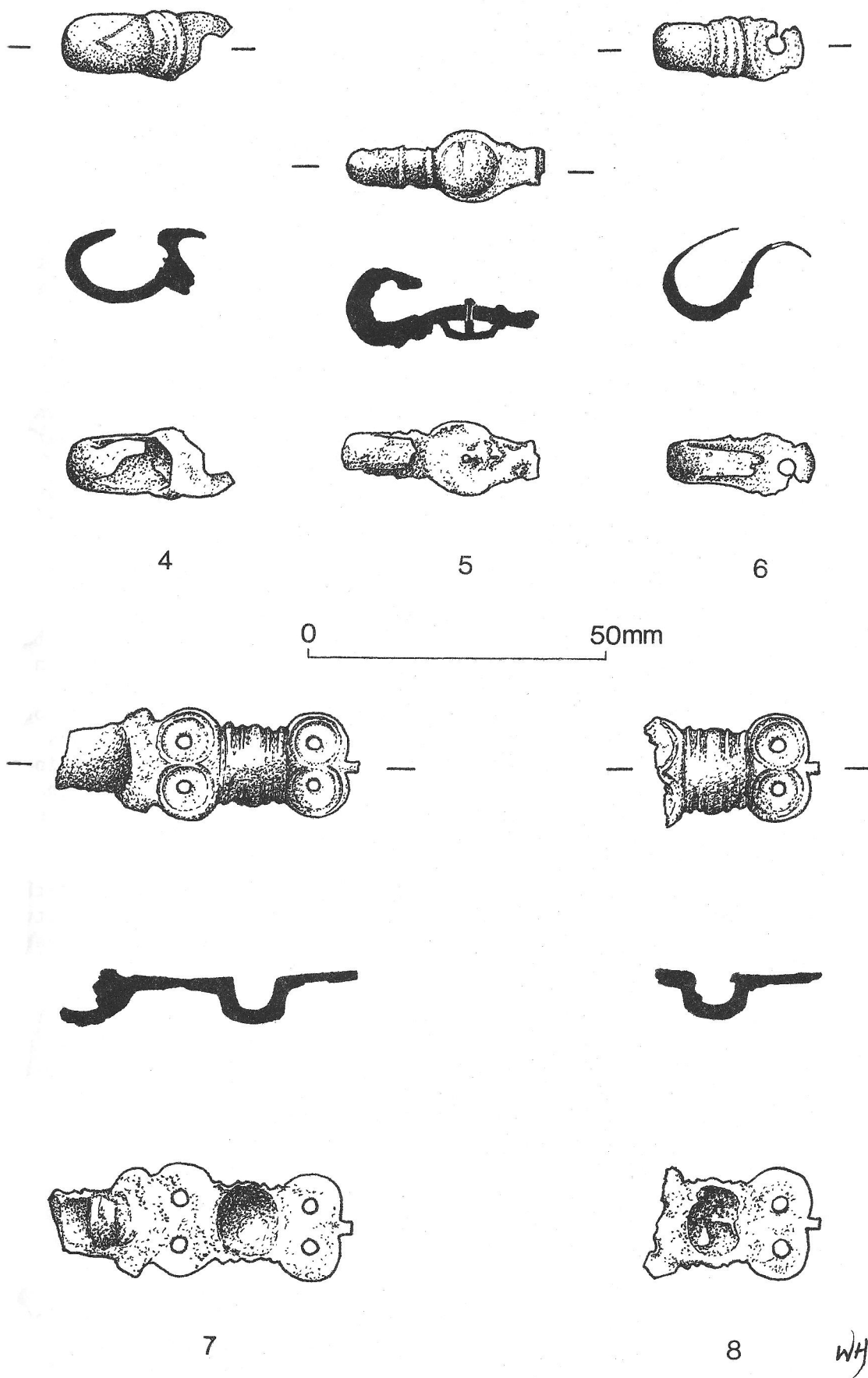
of No.2, although no beading can be discerned. The incised triangle is clearly visible. Signs of wear are only clear on one side of the loop, which may suggest idiosyncratic use. The loop is broken on the underside, almost certainly before loss. The lower end of the body, with its rivet area, is missing, but it is broadly similar to that of No.2, although the volutes are not present, the upper surface is slightly convex, and the circle around the surviving rivet hole has been slightly recessed. No signs of burring on the rear face around the rivet hole. Heavily patinated and slightly pitted on the loop. Maximum length: 47mm; maximum width of body: 13mm; maximum width of loop: 10mm; internal diameter of loop: 9.5mm; height of scarp between loop and body: 8mm; thickness of body: 2mm; diameter of rivet hole: 3mm

4. 'Spectacle' junction loop (type 1c; inv.no.75.1340). Fig.33. This fragment is recognisable as being closely akin to No.3. The U-shaped loop is decorated with an incised triangle and there is a high scarp between the loop and the body of the fitting, consisting of a medium band with narrow bands on either side of it. The loop has been bent up beneath the body in such a way as to suggest that the fitting was wrenched out of shape; the 'return' of the loop, to which the rivets fastened, has been torn and distorted where it is broken off. There are signs of wear around the apex of the loop. Only a small fragment of the body around one rivet hole survives and that is bent at an acute angle in relation to the loop. The body is made of extremely thin metal, possibly the reason for its failing. Hardly any patination; 'bright' metal objects from Corbridge normally originate in anaerobic conditions, since the soil conditions are so hostile to copper alloy artefacts, and one of the various ditches discovered by Forster and Knowles seems the most likely provenance for this item.<sup>190</sup>

Maximum length: 29mm; maximum width of body: 10mm; maximum width of loop: 9mm; internal diameter of loop: 9mm; height of scarp between loop and body: 6mm; thickness of body: 0.25mm

5. 'Spectacle' junction loop (type 1d?; inv.no.75.1342). Fig.33. The loop does not appear to be hollow on this example and there is no trace of an incised triangle on its surface. The moulding at the junction between the loop and body is a broad band with a narrow one above and below it, but there is no significant scarp. There are no clear signs of wear at the apex of the loop, but this area is quite heavily corroded. The body is slightly convex and broken off below the first rivet base, the domed rivet head still being in place. The object is heavily patinated, as well as corroded in some areas (notably the rear face of the loop and body). Maximum length: 33mm; maximum width of body: 12mm; maximum width of loop: 6mm; internal diameter of loop: 5.5mm; height of scarp between loop and body: 0.5mm; thickness of body: 1.5mm; diameter of rivet head: 10mm; height of rivet head: 2mm

6. 'Spectacle' junction loop (type 1d?; inv.no.75.1341). Fig.33. A fragmentary example which appears to have been (mechanically?) cleaned fairly vigorously at some stage since recovery. The loop bears no trace of the normal incised triangle. The moulding is unlike that of the previous junction loops, consisting of a broad U-shaped groove with double narrow bands above and below it. These



**Fig.33:** Junction loops from Corbridge (Nos.4-8). Scale 1:1.

are not executed in very high profile and the scarp between the loop and body is not very pronounced. There are no signs of wear at the apex of the loop. What remains of the body - essentially just part of one rivet base - is bent upwards. An incised circle is discernible around the rivet hole, but the body metal is quite thin (possibly as a result of the cleaning). There is patination within the pitting on the surface of the object, but otherwise it displays 'bright' metal.

Maximum length: 23mm; maximum width of body: 10mm; maximum width of loop: 7.5mm; internal diameter of loop: 8mm; height of scarp between loop and body: 2mm; thickness of body: 0.25mm; diameter of rivet hole: 2.5mm

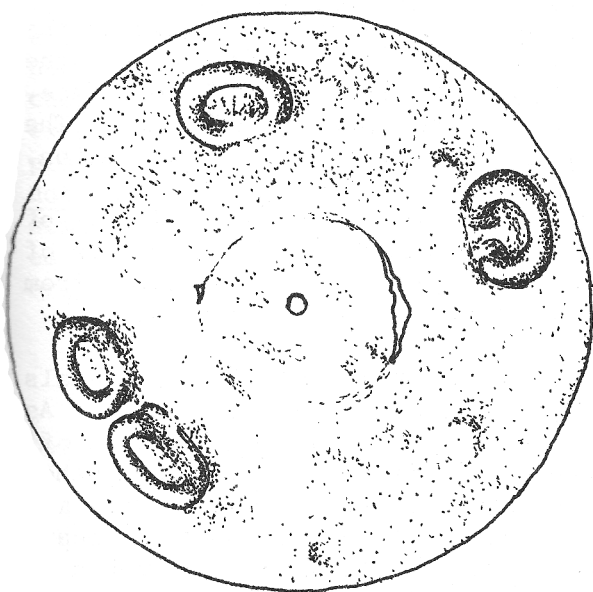
7. 'Double spectacle' junction loop (type 3a: inv.no.75.1343). Fig.33. The loop of this fitting has a very shallow U-shaped section and meets the body in a flush junction on the upper face, whilst on the lower there is a massive lug, and it may have been intended that the strap should butt against this. The loop itself has fractured below the apex before loss. The body flares in what are probably degraded volutes between the loop and the first pair of rivet holes, the bases of which are slightly recessed into the body of the fitting, which is, in turn, almost convex. The rivet holes are surrounded by an incised circle, with the left hand circle overlapping the right (when seen with the loop at the top). There is no sign of burring on the rear face of the rivet holes. Between this pair of rivet bases and the next is a massive piece of moulded decoration, consisting of a broad band with two pairs of narrow bands above and below it, the outermost bands being slightly more pronounced than the inner ones. The back of this moulding is hollow, and there is a steep scarp on either side at the junction with the body. The body is terminated with another dual rivet base, this time with the right-hand incised circle overlapping the left. A small rectangular tongue of metal finishes the item at the bottom. This item is heavily patinated with quite heavy corrosion on the loop.

Maximum length: 52mm; maximum width of body: 19mm; maximum width of loop: 10mm; length of moulding: 11mm; height of scarps between moulding and body: 3mm; thickness of body: 1.75mm; thickness at moulding: 6.5mm; diameter of rivet holes: 2mm

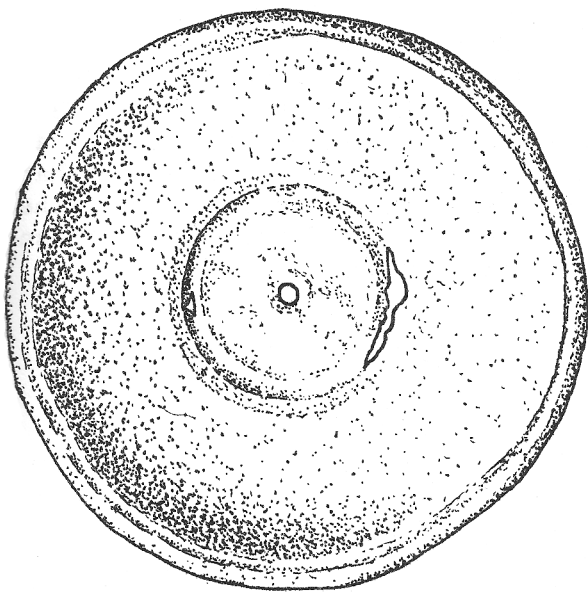
8. 'Double spectacle' strap fitting, probably a junction loop (type 3a?; inv.no.75.1346). Fig.33. There is no loop surviving for this fragment, but it is so similar to No.7 that it is probably from the same hand. Details are virtually (but not exactly) the same as for the previous example. The object has fractured across the upper pair of rivet holes (which is a good reason for suspecting that it was originally a junction loop) and is heavily patinated.

Maximum length: 29mm; maximum width of body: 18mm; length of moulding: 10mm; height of scarps between moulding and body: 3mm; thickness of body: 1.75mm; thickness at moulding: 6.5mm; diameter of rivet holes: 2mm

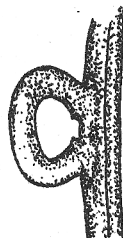
9. Junction phalera (inv.no.75.1348). Fig.34. Concave (although flatter towards the centre) copper alloy phalera of decorative type 5a, with four rings on its rear face (functional type 6a). Within the central dish of the phalera, a broad incised line surrounds the central rivet hole. There are traces of silver foil adhering to the front



9



0 50mm



WH

Fig.34: Junction phalera from Corbridge (No.9). Scale 1:1.

face of the object, but no remains of niello inlay can now be discerned. The object appears to be cast, although it is not clear whether the rings were formed as one with the piece or brazed on after casting. The phalera is slightly bent about what is probably the horizontal axis; otherwise, there is no sign of damage to the object, although there is a small amount of corrosion under the broad incised line, where the metal is thinner. On the rear face, there are what may be file marks around the bases of the rings. The object was marked '1996.' at some point subsequent to excavation. Heavily patinated and slightly corroded.

Diameter: 77mm; diam. of central incised circle: 28mm; diam. of central hole: 1.5mm; external widths of rings: 15mm; int. widths of rings: 6-7mm, height of rings: 13-14mm; distance of rings from perimeter: 9mm

The six spectacle type loops represented here are all individuals and none appear to be from the same hand, let alone the same melt. As such, they are similar in so far as they are 'in the tradition of' spectacle type fittings. The double-spectacle fittings, on the other hand, show a remarkable degree of similarity, although they are unlikely to be from the same mould, since the *cire-perdue* method meant that each casting was truly unique and the mould had to be broken to extract the object.<sup>191</sup> Objects may resemble each other when a series of castings were made using the same master to form the mould (a method that has been advocated by Oldenstein for the transmission, by copying, of designs in the 2nd and 3rd centuries on the German and Raetian limes<sup>192</sup>). The differences between Nos.7 and 8 are small, but such that they cannot be put down to idiosyncracies of the mould. It is, however, possible that they are due to the finishing process (removing sprues, filing off casting flashes). Nevertheless, it seems fairly certain that these two pieces are the work of the same workshop and probably the same craftsman (insofar as they probably derive from a common original used to form their moulds). It is interesting to note in passing that none of the pieces examined is intact.

There are two broad traditions of strap fitting represented by these eight objects, but within these there are seven individual designs. Such artefacts, seemingly so insignificant, nevertheless exhibit individuality to such a degree that the notion that designs may be characteristic of particular workshops cannot be ignored.<sup>193</sup> In that sense, cavalry harness fittings might plausibly be diagnostic of the unit that discarded them. Only detailed analysis of fittings like these on a large scale will enable us to confirm this hypothesis.



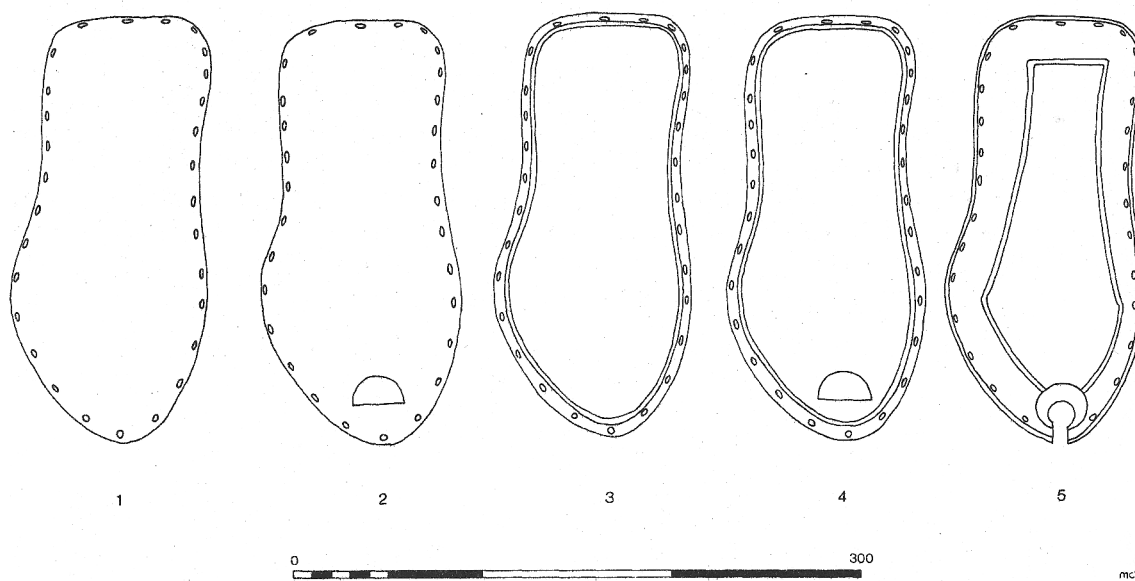
### APPENDIX 3: CATALOGUE AND TYPE SKETCHES

The catalogue of cavalry harness equipment presented here, along with the type sketches which accompany it (Figs.35-56), can be used to assist in the identification of archaeological finds. However, it is necessary to stress that, whilst every effort has been made to make them as comprehensive as possible, there are bound to be published examples which have been missed, as well as a great many unpublished pieces. The type sketches have been deliberately simplified: they are not intended as accurate small finds drawings, but should be used simply as a guide to form. Full references are given in the tables for each type illustrated and the researcher is recommended to examine the original publication if parallels are sought.

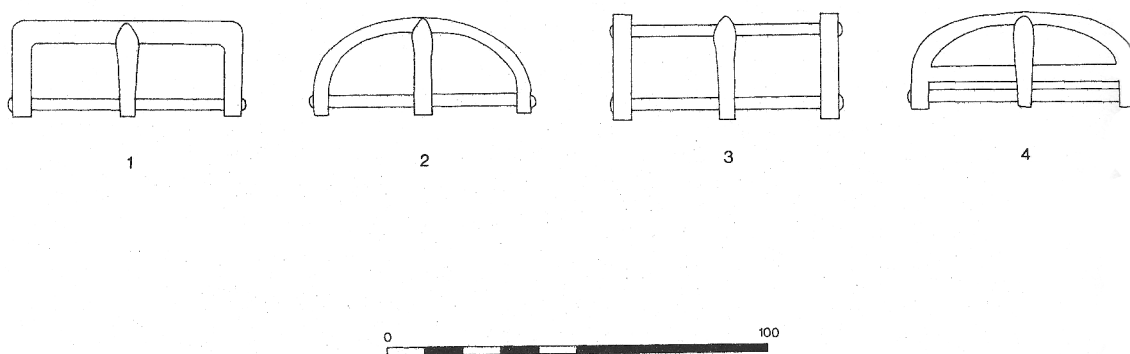
#### SADDLE HORNS

Type	Site	Component	Height (mm)	Reference
1	Haltern	Front	210.0	MAKW, 1905, Taf.XIX,8
1	Mainz Weisenau	Rear Left	158.0	KESSLER, 1940, Abb.7,5
1	Mainz Weisenau	Front	198.0	<u>Ibid.</u> , Abb.7,6
1	Mainz Weisenau	Rear Right	170.0	<u>Ibid.</u> , Abb.7,7
1	Neuß	Rear Right	?	TAUCH, 1983, 10 (figure)
1	Newstead, Pit XXII	Front	197.0	CURLE, 1911, Pl.XXXII
1	Newstead, Pit XXII	Front	197.0	<u>Loc. cit.</u>
1	Newstead, Pit XXII	Rear Left	185.0	<u>Loc. cit.</u>
1	Newstead, Pit XXII	Rear Right	185.0	<u>Loc. cit.</u>
1	Newstead, Pit XXVII	Front	200.0	<u>Loc. cit.</u>
1	Newstead, Pit XXVII	Front	200.0	<u>Loc. cit.</u>
1	Newstead, Pit XXVII	Rear Left	194.0	<u>Loc. cit.</u>
1	Newstead, Pit XXVII	Rear Right	196.0	<u>Loc. cit.</u>
1	Rottweil	Front	206.0	PLANCK, 1975, Taf.78,1
1	Rottweil	Front	206.0	<u>Ibid.</u> , Taf.78,2
1	Rottweil	Rear Left	182.0	<u>Ibid.</u> , Taf.77
1	Rottweil	Rear Right	176.0	<u>Ibid.</u> , Taf.76
1	Sheepen, region 3	Rear Right?	163.0	HAWKES & HULL, 1947, Pl.CI,a; b
1?	Sheepen, near A4	?	175.0	<u>Ibid.</u> , Pl.CI.c; d
2	Neuß, barracks 40/41	Front	174.0	LEHNER, 1904, Taf.XXXA,50
2	Neuß, barracks 40/41	Front	156.0	<u>Ibid.</u> , Taf.XXXA,52
2	Neuß	Front	?	TAUCH, 1983, 10 (figure)
2	Neuß	Front	?	<u>Loc. cit.</u>
3	Neuß	Rear Right	?	<u>Loc. cit.</u>
3	Neuß	Rear Right	?	<u>Loc. cit.</u>
3	Unprovenanced	Front	198.0	LAWSON, 1978, Taf.52,4
3	Vinkovci	Rear Right	?	HOFFILLER, 1912, S1.21
4	Moers-Asberg	Front	215.0	HORN, 1977, Abb.69
4	Moers-Asberg	Front	215.0	<u>Loc. cit.</u>
4	Moers-Asberg	Rear Left	195.0	<u>Ibid.</u> , Abb.71
4	Moers-Asberg	Rear Right	195.0	<u>Ibid.</u> , Abb.70
5	Mainz Weisenau	Front	206.0	KESSLER, 1940, Abb.7,1
5	Mainz Weisenau	Front	188.0	<u>Ibid.</u> , Abb.7,2
5	Mainz Weisenau	Rear Right	178.0	<u>Ibid.</u> , Abb.7,3
5	Mainz Weisenau	Rear Left	180.0	<u>Ibid.</u> , Abb.7,4
?	Neuß, barracks 40/41	?	?	LEHNER, 1904, 367

TABLE 1



**Fig.35:** Type sketches for saddle horns.  
(scale in mm)



**Fig.36:** Type sketches for girth buckles.  
(scale in mm)

## GIRTH BUCKLES

Type	Site	Internal width (mm)	Reference
1	Aislingen	61.0	ULBERT, 1959, Taf.18,26
1	Augsburg-Oberhausen	42.0	HUBENER, 1973, Taf.23,33
1	Augsburg-Oberhausen	44.0	<u>Ibid.</u> , Taf.23,34
1	Augsburg-Oberhausen	42.0	<u>Ibid.</u> , Taf.23,41
1	Chichester	49.0	DOWN, 1978, Fig.10.32,35
1	Hofheim	48.0	RITTERLING, 1904, Taf.IV,52
1	Hofheim	56.0	<u>Ibid.</u> , 1913, Taf.XIV,21
1	Hofheim	50.0	<u>Ibid.</u> , Taf.XIV,23
1	Hofheim	48.0	<u>Ibid.</u> , Taf.XIV,26
1	Laure-Minervois	44.0	FEUGÈRE, 1982, Fig.19,a
1	Riftissen	63.0	<u>Ibid.</u> , Taf.61,36
1	Waddon Hill	46.0	WEBSTER, 1979, Fig.40,215
1	Woodcock Hall	58.0	BROWN, 1986, Fig.31,238
2	Hofheim	62.0	RITTERLING, 1913, Taf.XIV,20
2	Rottweil	67.0	PLANCK, 1975, Taf.34,16
3	Hüfingen	54.0	ORL Nr.62a, Taf.XI,62
4	Aislingen	61.5	ULBERT, 1959, Taf.18,24
4	Augsburg-Oberhausen	42.0	HUBENER, 1973, Taf.14,12
4	Augsburg-Oberhausen	43.0	<u>Ibid.</u> , Taf.23,43

**Table 2**



1a



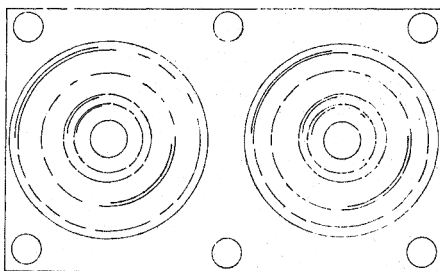
1b



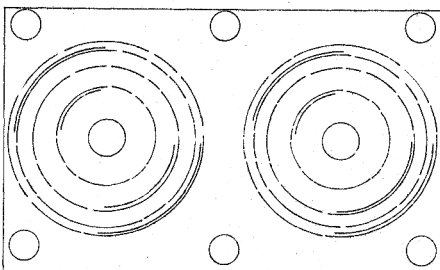
1c



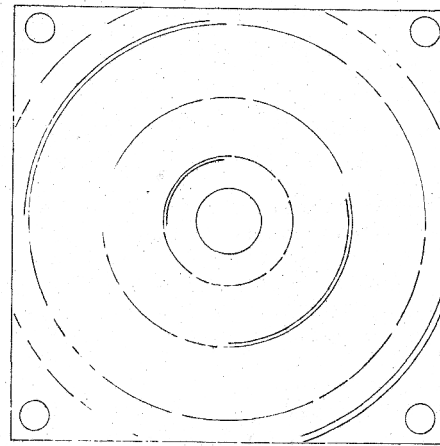
1d



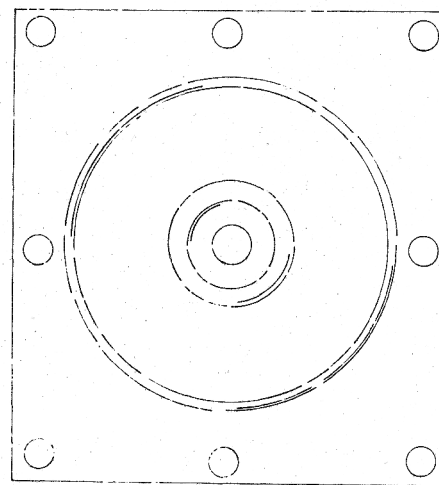
2a



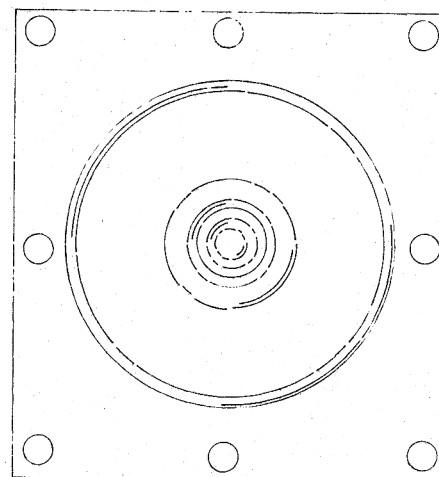
2b



3a



3b



3c



mcb

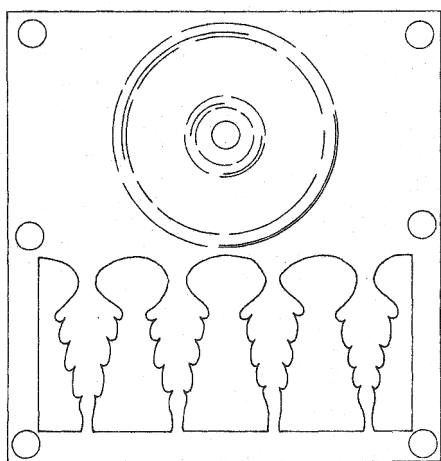
(scale in mm)

**Fig.37:** Type sketches for saddle plates, Types 1-3.

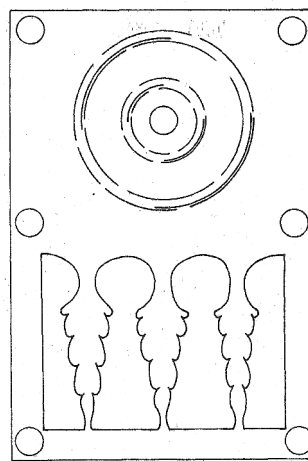
## SADDLE PLATES

Type	Site	Width (mm)	Height (mm)	Reference
1a	Doorwerth	84	25	BROUWER, 1982, Nr.233
1a	Doorwerth	84	27	Ibid., Nr.204
1a	Doorwerth	84	21	Ibid., Nr.201
1a	Doorwerth	84	26	Ibid., Nr.203
1a	Doorwerth	84	27	Ibid., Nr.205
1a	Doorwerth	84	27	Ibid., Nr.202
1a	Doorwerth	105	24	BROUWER, 1982, Nr.237
1a	Doorwerth	105	25	Ibid., Nr.238
1a	Doorwerth	123	26	Ibid., Nr.232
1a	Doorwerth	123	26	Ibid., Nr.231
1a	Doorwerth	123	26	Ibid., Nr.230
1a	Doorwerth	123	26	Ibid., Nr.229
1a	Doorwerth	123	26	Ibid., Nr.228
1a	Doorwerth	126	23	Ibid., Nr.251
1a	Doorwerth	126	25	Ibid., Nr.248
1a	Doorwerth	127	25	Ibid., Nr.247
1a	Doorwerth	127	23	Ibid., Nr.250
1a	Doorwerth	128	24	Ibid., Nr.249
1a	Newstead	96	26	CURLE, 1911, Pl.XXV,44
1a	Newstead	96	27	Ibid., Pl.XXV,42
1b	Doorwerth	75	23	Ibid., Nr.217
1b	Doorwerth	76	24	Ibid., Nr.216
1b	Doorwerth	81	22	Ibid., Nr.220
1b	Doorwerth	82	22	Ibid., Nr.221
1b	Doorwerth	84	22	Ibid., Nr.210
1c	Heddernheim	65	30	FISCHER, 1973, Abb.22,2
1d	Hüfingen	96	33	ORL Nr.62a, Taf.XI,102
2a	Castleford	114	68	Plate A: report forthcoming
2a	Castleford	114	70	Plate C: report forthcoming
2b	Doorwerth	80	45	BROUWER, 1982, Nr.215
2b	Doorwerth	80	53	Ibid., Nr.219
2b	Doorwerth	80	50	Ibid., Nr.218
2b	Doorwerth	84	51	Ibid., Nr.200
2b	Doorwerth	84	52	Ibid., Nr.199
2b	Doorwerth	85	50	Ibid., Nr.209
2b	Doorwerth	105	128 (sic)	Ibid., Nr.236
2b	Doorwerth	121	69	Ibid., Nr.227
2b	Doorwerth	125	62	Ibid., Nr.245
2b	Doorwerth	125	63	Ibid., Nr.246
2b	Doorwerth	127	62	Ibid., Nr.243
2b	Doorwerth	127	63	Ibid., Nr.244
2b	Neuß	73	60	LEHNER, 1904, Taf.XXXB,60
2b	Newstead	72	54	CURLE, 1911, Pl.LXXII.4
2b	Newstead	96	53	Ibid., Pl.LXXII.14
3a	Doorwerth	70	67	BROUWER, 1982, Nr.284
3a	Doorwerth	74	79	Ibid., Nr.214
3a	Doorwerth	74	79	Ibid., Nr.213
3a	Doorwerth	105	101	Ibid., Nr.235
3a	Doorwerth	125	129	Ibid., Nr.242
3a	Rheingönheim	72	77	ULBERT, 1969, Taf.19,14
3b	Doorwerth	79	103	BROUWER, 1982, Nr.254
3b	Doorwerth	81	103	Ibid., Nr.255
3b	Doorwerth	83	100	Ibid., Nr.207
3b	Doorwerth	84	64	Ibid., Nr.198
3b	Doorwerth	84	65	Ibid., Nr.208
3b	Doorwerth	84	102	Ibid., Nr.195
3b	Doorwerth	84	101	Ibid., Nr.197

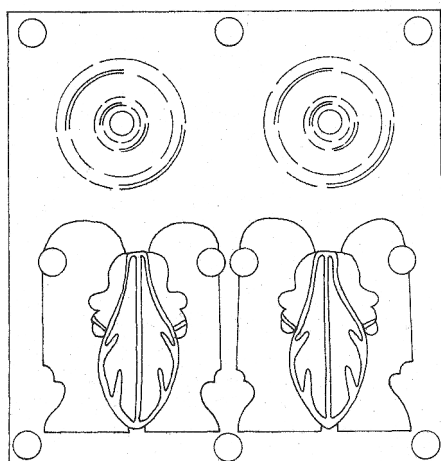
**Table 3**



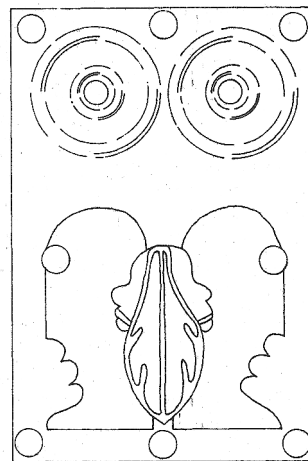
4a



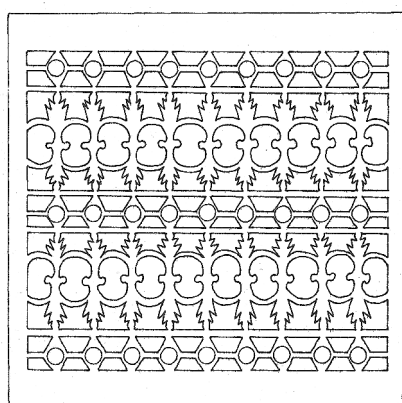
4b



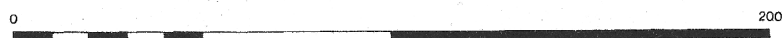
5a



5b



6



mcb

(scale in mm)

**Fig.38:** Type sketches for saddle plates, Types 4-6.

3b	Doorwerth	84	101	<u>Ibid.</u> , Nr.196
3b	Doorwerth	120	80	<u>Ibid.</u> , Nr.225
3b	Doorwerth	122	132	<u>Ibid.</u> , Nr.224
3b	Doorwerth	122	79	<u>Ibid.</u> , Nr.226
3b	Doorwerth	127	135	<u>Ibid.</u> , Nr.241
3b	Neuß	73	101	LEHNER, 1904, Taf.XXXB,58
3c	Castleford	114	125	Plate B: report forthcoming
4a	Doorwerth	125	133	BROUWER, 1982, Nr.239
4a	Doorwerth	125	134	<u>Ibid.</u> , Nr.240
4b	Doorwerth	81	118	BROUWER, 1982, Nr.2 53
4b	Doorwerth	81	119	<u>Ibid.</u> , Nr.252
4b	NeuB	73	118	LEHNER, 1904, Taf.XXXB,59
5a	Doorwerth	105	101	<u>Ibid.</u> , Nr.234
5a	Doorwerth	123	150	<u>Ibid.</u> , Nr.222
5a	Doorwerth	123	150	<u>Ibid.</u> , Nr.223
5b	Doorwerth	73	109	<u>Ibid.</u> , Nr.212
5b	Doorwerth	75	112	<u>Ibid.</u> , Nr.211
5b	Doorwerth	84	136	<u>Ibid.</u> , Nr.194
5b	Doorwerth	84	136	<u>Ibid.</u> , Nr.193
5b	Doorwerth	85	137	<u>Ibid.</u> , Nr.206
6	Aislingen	55	45	ULBERT, 1959, Taf.19,19
6	Aislingen	93	105	<u>Ibid.</u> , Taf.19,20
6	Baden	96	42	UNZ, 1971, Abb.5,41
6	Haltern	95	34	<u>Ibid.</u> , Taf.II,2
6	Salona	82	45	WERNER, 1952, Taf.II,1
6	Vindonissa	50	42	UNZ, 1973, Abb.11,118
6	Vindonissa	94	44	UNZ, 1973, Abb.11,119

Further fragments of type 6 plates are known from Moers-Asberg (BECHERT, 1974, Abb.71,6), Wiesbaden (ORL Nr.31, Taf.X,58; 63), Hofheim (RITTERLING, 1904, Taf.III,17), Aislingen (ULBERT, 1959, Taf.19,18), Rheingönheim (ULBERT, 1969, Taf.28,14; 16), and Vindonissa (UNZ, 1973, Abb.11,118)

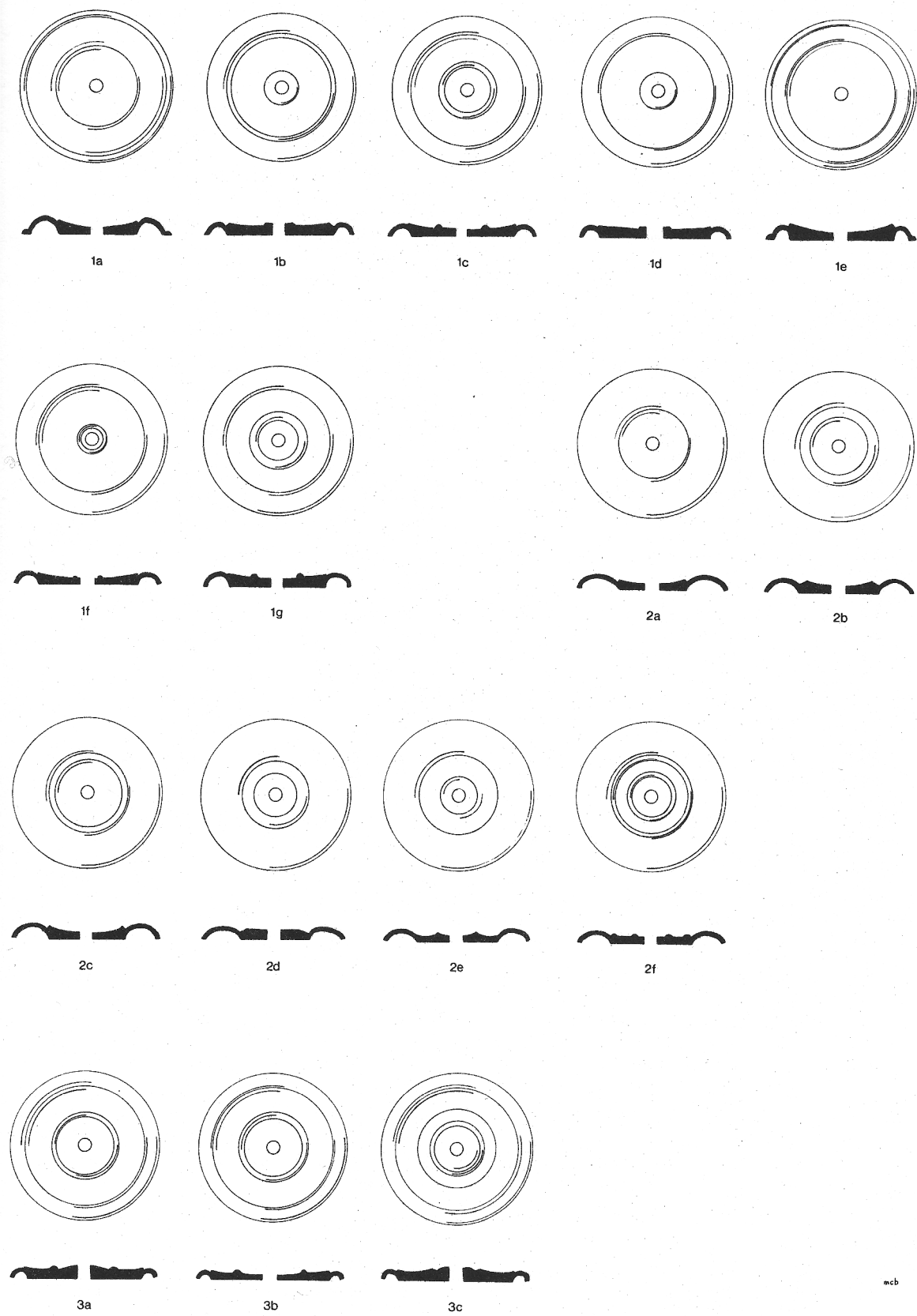
**Table 3**

## JUNCTION RINGS

Site	Ext. Diam. (mm)	Int. Diam. (mm)	No. of Loops	Reference
Augsburg- Oberhausen	39	21	4	HÜBENER, 1973, Taf.13,1
Birten	35	20	4	HINZ, 1972, Bild 12,16
Hüfingen	39	21	4	REVILLIO, 1929, Abb.4,2
Kempton	46	21	4	KRÄMER, 1957, Taf.16,23
Lincoln	30	17	4	WEBSTER, 1949, Pl.X,a
The Lunt	41	25	4	HOBLEY, 1969, Fig.20,3
Moers-Asberg	43	23	4	BECHERT, 1974, Abb.71,1 & 72
Nijmegen	38	20	4	BOGAERS & HAALEBOS, 1975, Fig.12
Strasbourg	45	24	4	FORRER, 1927, Taf.LXXVI,Q
Strasbourg	42	21	4	<i>Ibid.</i> , Taf.LXXVII,1
Strasbourg	37	22	4	<i>Ibid.</i> , Taf.LXXVII,2
Valkenburg	50	28	4	GLASBERGEN & GROENMAN-VAN WAATERINGE, Pl.14,48
Hod Hill	33	17	3	BRAILSFORD, 1962, Fig.2,A30
Hofheim	34	16	3	RITTERLING, 1913, Taf.XIII,8
Hofheim	39	20	3	<i>Ibid.</i> , Taf.XIII,34
Hüfingen	36	21	3	REVILLIO, 1929, Abb.4,1
Seven Sisters	-	30	3	DAVIES & SPRATLING, 1976, No.4
Sheepen	14	10	3	HAWKES & HULL, 1947, Pl.CIII,9
Augsburg- Oberhausen	40	26	2	HÜBENER, 1973, Taf.13,2
Castleford	32	22	2	Report forthcoming
Hod Hill	19	11	2	BRAILSFORD, 1962, Fig.2,A31
Hofheim	15	11	2	RITTERLING, 1913, Taf.XIII,7
Windisch	48	27	2	SITTERDING, 1962, Abb.18,10
Augsburg- Oberhausen	20	14	1	HÜBENER, 1973, Taf.13,12
Hofheim	35	19	1	RITTERLING, 1913, Taf.XIII,41
Hüfingen	37	26	1	REVILLIO, 1929, Abb.4,3
Seven Sisters	46	24	1	DAVIES & SPRATLING, 1976, No.1

**Table 4**



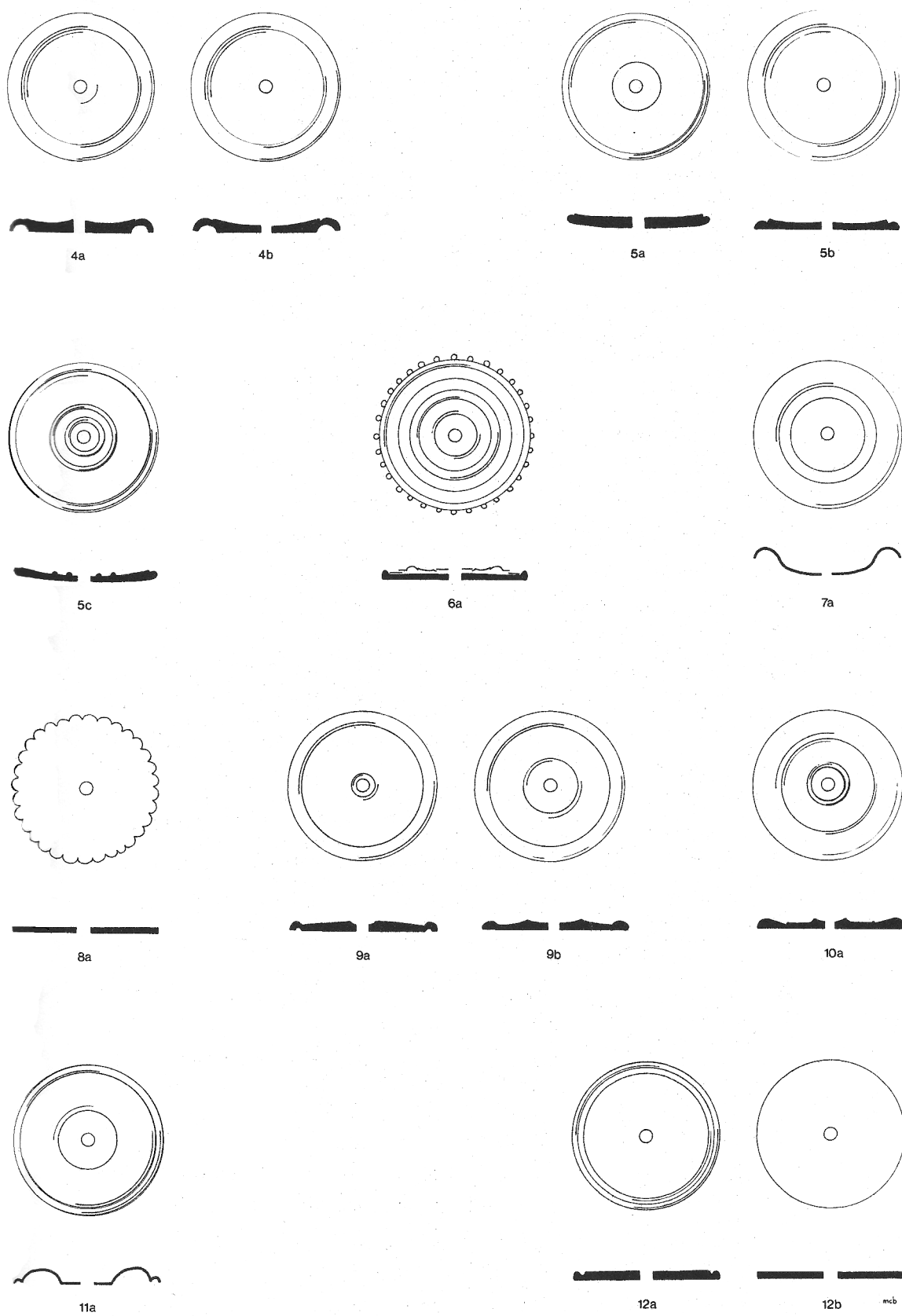


**Fig.39:** Types sketches (decorative) for phalerae, Types 1-3.

## PHALERAE TYPES

Dec. Type	Susp. Type	Provenance	Diam (mm)	Reference
1a	1a	Doorwerth	44.0	BROUWER, 1982, Nr.106
1a	1a	Doorwerth	43.0	Ibid., Nr.107
1a	1a	Doorwerth	45.0	Ibid., Nr.108
1a	1a	Doorwerth	45.0	Ibid., Nr.109
1a	1a	Doorwerth	45.0	Ibid., Nr.110
1a	1a	Doorwerth	40.0	Ibid., Nr.111
1a	1a	Doorwerth	44.0	Ibid., Nr.112
1a	1a	Doorwerth	42.0	Ibid., Nr.113
1a	1a	Doorwerth	44.0	Ibid., Nr.114
1a	1a	Doorwerth	45.0	Ibid., Nr.115
1a	1a	Doorwerth	40.0	Ibid., Nr.116
1a	1a	Doorwerth	45.0	Ibid., Nr.117
1a	1a	Doorwerth	43.0	Ibid., Nr.118
1a	1a	Doorwerth	45.0	Ibid., Nr.119
1a	1a	Doorwerth	43.0	Ibid., Nr.120
1a	1a	Doorwerth	43.0	Ibid., Nr.121
1a	1a	Doorwerth	45.0	Ibid., Nr.122
1a	1a	Doorwerth	45.0	Ibid., Nr.123
1a	1a	Doorwerth	44.0	Ibid., Nr.124
1a	1a	Doorwerth	44.0	Ibid., Nr.125
1a	1a	Doorwerth	42.0	Ibid., Nr.126
1a	1a	Doorwerth	42.0	Ibid., Nr.127
1a	1a	Doorwerth	43.0	Ibid., Nr.128
1a	1a	Doorwerth	45.0	Ibid., Nr.129
1a	1a	Doorwerth	45.0	Ibid., Nr.130
1a	1a	Doorwerth	?	Ibid., Nr.131
1b	1b	Doorwerth	?	BROUWER, 1982, Nr.132
1b	1b	Doorwerth	43.0	Ibid., Nr.133
1b	1b	Doorwerth	44.0	Ibid., Nr.134
1b	1b	Doorwerth	43.0	Ibid., Nr.135
1b	1b	Doorwerth	44.0	Ibid., Nr.136
1b	1b	Doorwerth	43.0	Ibid., Nr.137
1b	1a	Xanten	43.0	JENKINS, 1985, NO.C26
1b	1a	Xanten	43.0	Ibid., NO.C27
1b	1a	Xanten	43.0	Ibid., NO.C28
1b	1a	Xanten	43.0	Ibid., NO.C29
1b	1a	Xanten	43.0	Ibid., NO.C30
1b	1a	Xanten	44.0	Ibid., No.C31
1b	1a	Xanten	40.5	Ibid., No.C32
1b	1a	Xanten	40.5	Ibid., No.C33
1b	1a	Xanten	41.5	Ibid., No.C34
1b	1a	Xanten	41.0	Ibid., NO.C35
1b	1a	Xanten	39.0	Ibid., No.C36
1b	1a	Xanten	38.0	Ibid., No.C37
1b	1a	Xanten	39.0	Ibid., NO.C38
1b	1a	Xanten	39.0	Ibid., No.C39
1c	3c	Doorwerth	89.0	BROUWER, 1982, Nr.176
1c	1d	Doorwerth	85.0	Ibid., Nr.177
1c	1d	Doorwerth	89.0	Ibid., Nr.178
1c	?	Nawa	75.0	ABDUL-HAK, 1955, Pl.XI.1
1c	6b?	Nawa	75.0	Ibid., Pl.XI.1
1c	?	Nawa	75.0	Ibid., Pl.XI.1
1c	3a	Xanten	100.5	JENKINS, 1985, No.A1
1c	4a	Xanten	105.0	Ibid., No.A2
1c	4a	Xanten	105.0	Ibid., No.A3
1c	6b	Xanten	101.0	Ibid., No.A4
1d	2a	Doorwerth	60.0	BROUWER, 1982, Nr.147
1d	2a	Doorwerth	60.0	Ibid., Nr.148
1d	2a	Doorwerth	60.0	Ibid., Nr.149

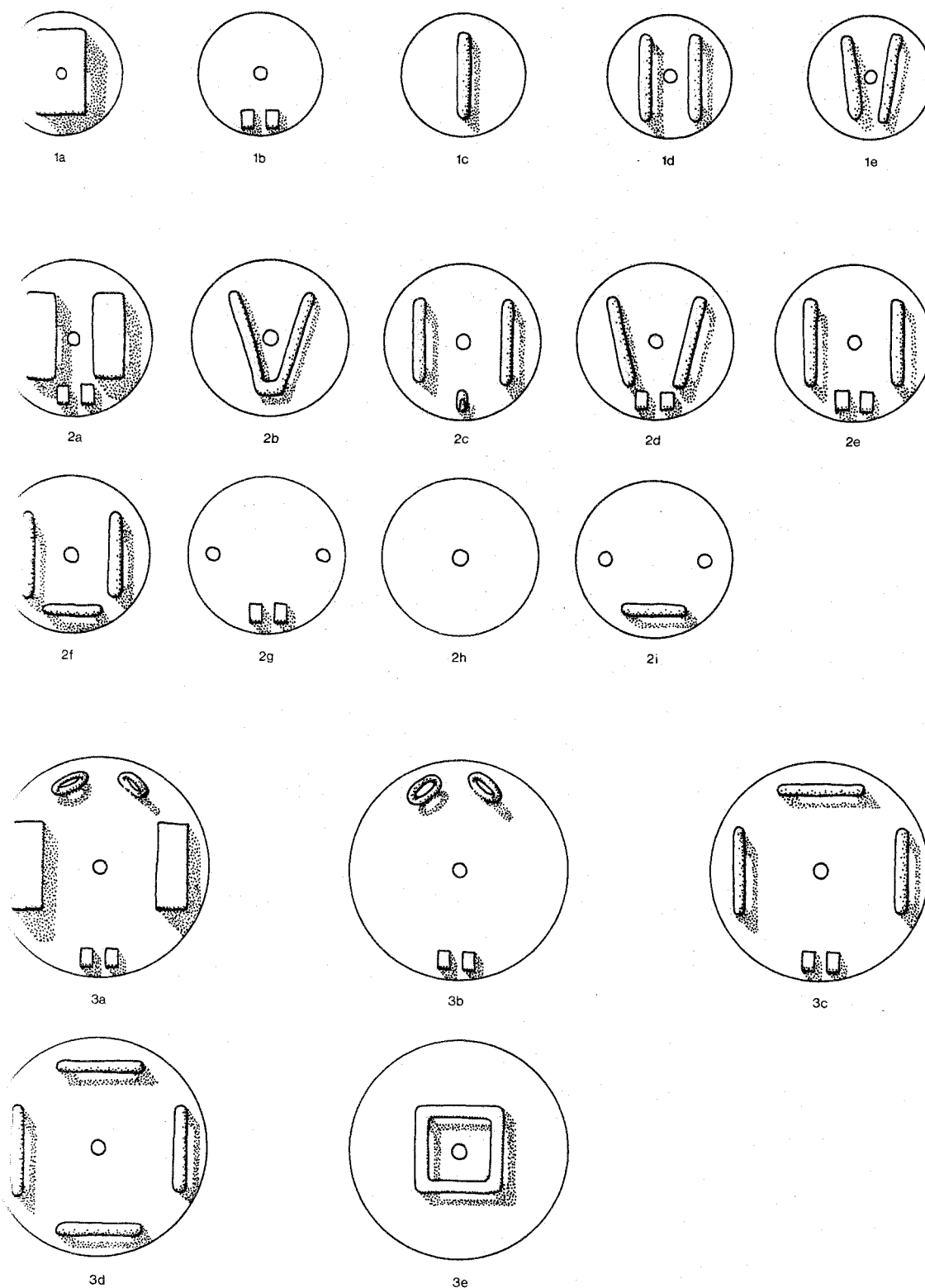
**Table 5**



**Fig.40:** Types sketches (decorative) for phalerae, Types 4-12.

1d	2a	Doorwerth	60.0	<u>Ibid.</u> , Nr.150
1d	2a	Doorwerth	61.0	<u>Ibid.</u> , Nr.151
1d	2a	Doorwerth	60.0	<u>Ibid.</u> , Nr.152
1d	2a	Doorwerth	60.0	<u>Ibid.</u> , Nr.153
1d	2a	Doorwerth	60.0	<u>Ibid.</u> , Nr.154
1d	2a	Doorwerth	58.0	<u>Ibid.</u> , Nr.155
1d	2a	Doorwerth	57.0	<u>Ibid.</u> , Nr.156
1d	2a	Doorwerth	60.0	<u>Ibid.</u> , Nr.157
1d	2a	Doorwerth	63.0	<u>Ibid.</u> , Nr.158
1d	2a	Doorwerth	61.0	<u>Ibid.</u> , Nr.159
1d	2a	Doorwerth	61.0	<u>Ibid.</u> , Nr.160
1d	2a	Doorwerth	61.0	<u>Ibid.</u> , Nr.161
1d	2a	Doorwerth	61.0	<u>Ibid.</u> , Nr.162
1d	2a	Doorwerth	61.0	<u>Ibid.</u> , Nr.163
1d	2a	Doorwerth	60.0	<u>Ibid.</u> , Nr.164
1d	2a	Doorwerth	58.0	<u>Ibid.</u> , Nr.165
1d	2a	Doorwerth	60.0	<u>Ibid.</u> , Nr.166
1d	2a	Doorwerth	59.0	<u>Ibid.</u> , Nr.167
1d	2a	Doorwerth	58.0	<u>Ibid.</u> , Nr.168
1d	2a	Doorwerth	59.0	<u>Ibid.</u> , Nr.169
1d	2a	Doorwerth	60.0	<u>Ibid.</u> , Nr.170
1d	2a	Doorwerth	61.0	<u>Ibid.</u> , Nr.171
1d	2a	Doorwerth	59.0	<u>Ibid.</u> , Nr.172
1d	2a	Doorwerth	63.0	<u>Ibid.</u> , Nr.173
1d	2a	Doorwerth	62.0	<u>Ibid.</u> , Nr.174
1d	2a	Doorwerth	62.0	<u>Ibid.</u> , Nr.175
1e	2b	Doorwerth	38.0	<u>Ibid.</u> , Nr.179
1e	2b	Doorwerth	39.0	<u>Ibid.</u> , Nr.180
1e	2b	Doorwerth	39.0	<u>Ibid.</u> , Nr.181
1e	2b	Doorwerth	39.0	<u>Ibid.</u> , Nr.182
1e	2h	Fremington Hagg	37.0	WEBSTER, 1971, No.24
1e	1a	Hod Hill	34.5	BRAILS FORD, 1962, Fig.5, A126
1e	1d?	Hüfingen	31.0	REVILLIO, 1929, Abb.2,2
1e	3c	Hüfingen	34.5	<u>Ibid.</u> , Abb.2,6
1e	?	Lixus	28.0	BOUBE-PICCOT, 1964, No.14
1e	2a	Neuß	40.5	LEHNER, 1904, Taf.XXXIV,16
1e	2b	Newstead	70.0	CURLE, 1911, 300-1, Pl.LXXIV,1
1e	2b	Newstead	75.0	<u>Ibid.</u> , 300-1, Pl.LXXIV,2
1e	2b	Newstead	78.0	<u>Ibid.</u> , 300-1, Pl.LXXIV,3
1e	2h?	Sheepen	34.0	HAWKES & HULL, 1947, Pl.CII,30
1e	2h?	Sheepen	38.0	<u>Ibid.</u> , Pl.CII,31
1e	2d	Wroxeter	40.0	BUSHE-FOX, 1916, Pl.XVIII,30
1f	6b?	Bonn	56.0	AuhV 4, Taf.45,4
1f	3a	Doorwerth	105.0	BROUWER, 1982, Nr.138
1f	3a	Doorwerth	107.0	<u>Ibid.</u> , Nr.139
1f	4a	Doorwerth	108.0	<u>Ibid.</u> , Nr.140
1f	4a	Doorwerth	108.0	<u>Ibid.</u> , Nr.141
1f	4a	Doorwerth	105.0	<u>Ibid.</u> , Nr.142
1f	4a	Doorwerth	108.0	<u>Ibid.</u> , Nr.143
1f	6a	Doorwerth	106.0	<u>Ibid.</u> , Nr.144
1f	6b	Doorwerth	107.0	<u>Ibid.</u> , Nr.145
1f	6a	Doorwerth	105.0	<u>Ibid.</u> , Nr.146
1f	2a	Xanten	54.5	JENKINS, 1985, No.B5
1f	2a	Xanten	55.0	<u>Ibid.</u> , No.B6
1f	2a	Xanten	53.0	<u>Ibid.</u> , No.B7
1f	2a	Xanten	53.0	<u>Ibid.</u> , No.B8
1f	2a	Xanten	52.5	<u>Ibid.</u> , No.B9
1f	2a	Xanten	55.0	<u>Ibid.</u> , No.B10
1f	2a	Xanten	54.5	<u>Ibid.</u> , No.B11
1f	2a	Xanten	55.0	<u>Ibid.</u> , No.B12
1f	2a	Xanten	55.0	<u>Ibid.</u> , No.B15
1f	2a	Xanten	54.5	<u>Ibid.</u> , No.B16
1f	2a	Xanten	56.0	<u>Ibid.</u> , No.B18
1f	2a	Xanten	54.5	<u>Ibid.</u> , No.B20
1f	2a	Xanten	55.0	<u>Ibid.</u> , No.B21

Table 5



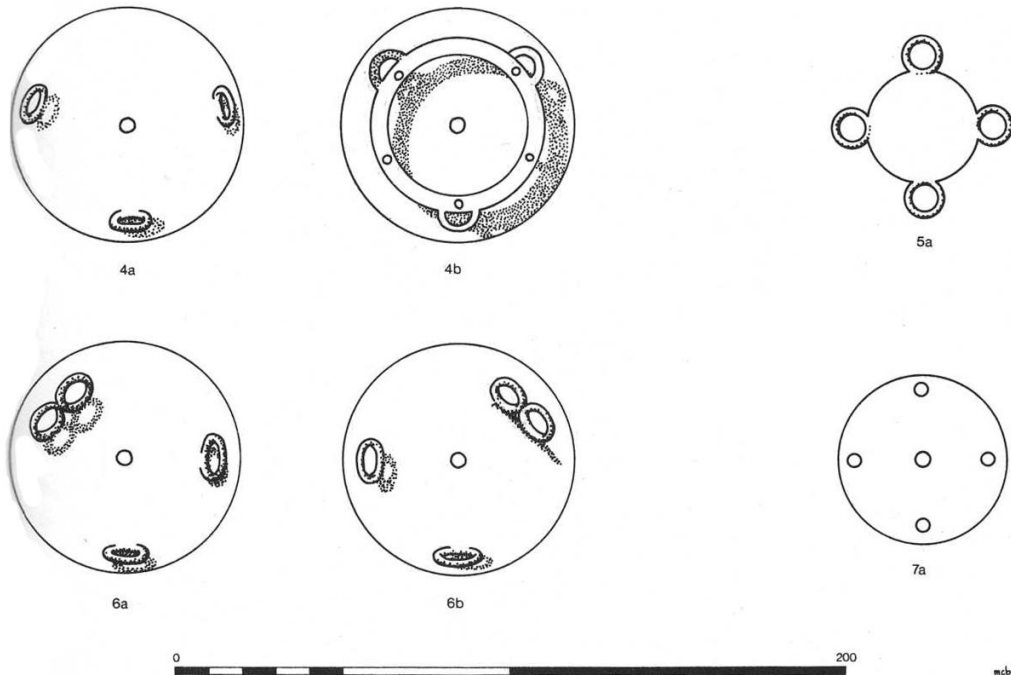
(scale in mm)  
**Fig.41:** Type sketches (functional)for phalerae, Types 1-3.

1f	2a	Xanten	54.5	<u>Ibid.</u> , No.B22
1f	2a	Xanten	50.5	<u>Ibid.</u> , No.B23
1g	3c	Fremington Hagg	73.0	WEBSTER, 1971, No.3
1g	3d	Fremington Hagg	71.0	<u>Ibid.</u> , No.16; CRADDOCK <u>et al.</u> , 1973, Fig.9
1g	3d	Fremington Hagg	54.0	WEBSTER, 1971, No. 17; CRADDOCK <u>et al.</u> , 1973, Fig.10
1g	2h	Seven Sisters	53.0	DAVIES & SPRATLING, 1976, No.2
2a	2b	Banasa	35.0	BOUBE-PICCOT, 1964, No.26
2a	2f	Braughing?	36.5	WEBSTER, 1974, Fig.1
2a	1c	Doorwerth	46.0	BROUWER, 1982, Nr.186
2a	2d	Doorwerth	35.0	<u>Ibid.</u> , Nr.191
2a	4a	Doorwerth	76.0	<u>Ibid.</u> , Nr.189
2a	6a	Doorwerth	77.0	<u>Ibid.</u> , Nr.188
2a	3c	Fremington Hagg	68.0	WEBSTER, 1971, No.8
2a	1e	Fremington Hagg	30.0	<u>Ibid.</u> , No.37
2a	2h?	Ham Hill	34.0	WEBSTER, 1960, Fig.5,121
2a	2d	Hod Hill	38.5	BRAILSFORD, 1962, Fig.5,A125
2a	?	Hofheim	36.0	RITTERLING, 1913, Taf.XV,71
2a	?	Hofheim	30.0	<u>Ibid.</u> , Taf.XV,78
2a	3c	Hüfingen	37.0	REVILLIO, 1929, Abb.2,7
2a	2b	Tabernae	32.0	BOUBE-PICCOT, 1964, No.24
2a?	2b	Alise-Sainte-Reine	43.0	RABEISEN & MENU, 1985, Fig.7,86
2a?	7a	Chichester	50.5	DOWN, 1978, Fig.10.32,44
2b	3a	Doorwerth	81.0	BROUWER, 1982, Nr.187
2b	1d	Fremington Hagg	53.0	WEBSTER, 1971, No.13; CRADDOCK <u>et al.</u> , 1973, No.13
2b	3d	Fremington Hagg	?	WEBSTER, 1971, No.14
2c	2b	Fremington Hagg	31.0	<u>Ibid.</u> , No.2
2c	?	Hofheim	43.0	RITTERLING, 1913, Taf.XII,13
2c	2h	Rißtissen	45.0	ULBERT, 1970, Taf.1,17
2d	2b	Newstead	80.0	CURLE, 1911, 300-1, Pl.LXXIV,10
2e	6b	Moers-Asberg	82.0	BECHERT, 1974, Abb.71,8
2f	3c	Banasa	65.0	BOUBE-PICCOT, 1964, No.15
2f	3c	Volubilis	71.0	<u>Ibid.</u> , No.16
3a	2c	Doorwerth	47.0	BROUWER, 1982, Nr.184
3a	3b	Doorwerth	75.0	<u>Ibid.</u> , Nr.184
3b	2a	Corbridge	35.0	Allason-Jones in BISHOP & DORE, forthcoming, No.137 (copper alloy)
3b	3c	Fremington Hagg	53.0	WEBSTER, 1971, No.10
3b	3c	Fremington Hagg	54.0	<u>Ibid.</u> , No.12; CRADDOCK <u>et al.</u> , 1973, Fig.7
3c	?	Hofheim	43.5	RITTERLING, 1913, Taf.XI,43
4a	2h	Colchester	34.5	WEBSTER, 1960, Fig.4,77
4a	2g	Fremington Hagg	35.0	<u>Id.</u> , 1971, No.4
4b	1d	Banasa	40.0	BOUBE-PICCOT, 1964, No.37 (a repair)
4b	5a	Kempton	32.0	KRÄMER, 1957, Taf.B,23
4b	5a	Newstead	86.0	CURLE, 1911, 302, Pl.LXXIV,6
4b	1d	Oberstimm	38.0	SCHÖNBERGER, 1978, Taf.24,B201
4b?	2e	Mainz	50.0	BEHRENS, 1914, Abb.2,13
4b?	5a	Oberaden	28.0	ALBRECHT, 1942, Taf.47,5
4b?	5a	Oberaden	28.0	<u>Ibid.</u> , Taf.47,6
4b?	1d	Rottweil	33.0	PLANCK, 1975, Taf.72,11
5a	1b?	Aislingen	60.0	ULBERT, 1959, Taf.19,13 (damaged?)
5a	2d	Banasa	36.0	BOUBE-PICCOT, 1964, No.20
5a	6a	Corbridge	78.0	Acc.No.75.1348
5a	2g?	Friedberg- Rederzhausen	31.5	VON SCHNURBEIN, 1983, Abb.8,12
5a	6b?	Heddernheim	77.0	FISCHER, 1973, Abb.16,1
5a	1d	Heddernheim	76.5	<u>Ibid.</u> , Abb.16,3
5a	2g	Hofheim	35.0	RITTERLING, 1913, Taf.XII,8

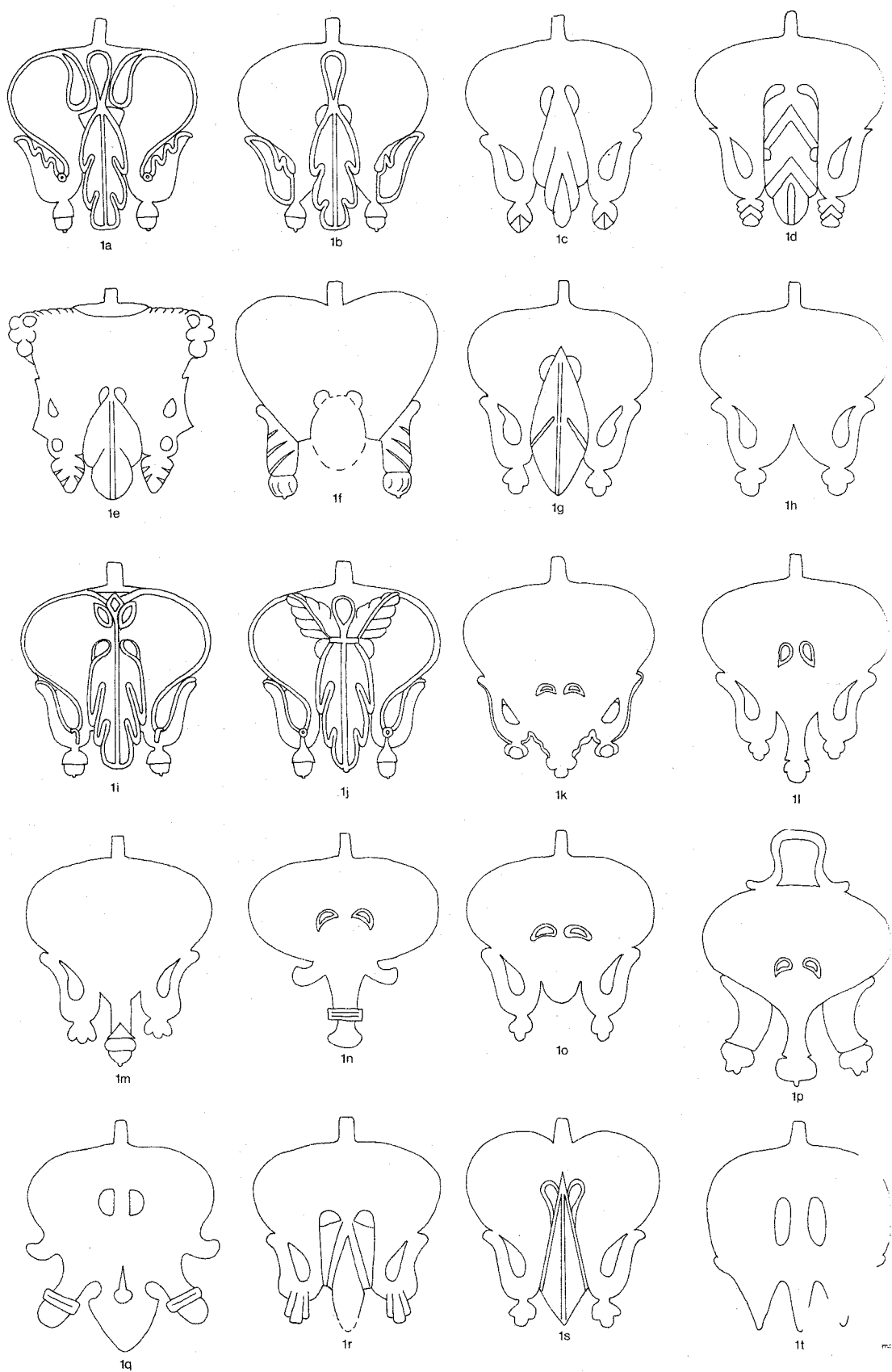
**Table 5**

**Table 5**

5a	1a	Newstead	31.0	CURLE, 1911, 300, Pl.LXXIII,1
5a	2b	Newstead	67.0	<i>Ibid.</i> , 300-1, Pl.LXXIV,8
5a	3e	Oberstimm	72.0	SCHONBERGER, 1978, Taf.24,B203
5a	1a	Rißtissen	34.0	ULBERT, 1970, Taf.1,18
5a	2e	Tanger	42.0	BOUBE-PICCOT, 1964, No.18
5a	2d	Tanger	40.0	<i>Ibid.</i> , No.19
5a	2e	Thamusida	38.0	<i>Ibid.</i> , No.13
5a	2f	Vindonissa	28.0	UNZ, 1973, Nr.146
5b	2g	Fremington Hagg	34.5	WEBSTER, 1971, No.23
5b	3c	Hüfingen	32.0	REVILLIO, 1929, Abb.2,5
5b	5a?	Hüfingen	66.5	<i>Ibid.</i> , Abb.2,8
5b	2b	Volubilis	45.0	BOUBE-PICCOT, 1964, No.1
5c	6a	Buciumi	74.0	CHIRILA et al., 1972, Taf.LXXX
6a	4b	Newstead	94.5	CURLE, 1911, Pl.LXXII,9
7a	2h	Fremington Hagg	49.0	WEBSTER, 1971, No.5
8a	2e	Rißtissen	40.5	ULBERT, 1959, Taf.65,5
9a	4a	Hüfingen	36.0	REVILLIO, 1929, Abb.2,1
9a	3c	Hüfingen	43.0	<i>Ibid.</i> , Abb.2,3
9b	?	Nawa	40.0	ABDUL-HAK, 1955, Pl.XI,2
9b	?	Nawa	30.0	<i>Ibid.</i> , Pl.XI,2
9b	2i	Oberstimm	40.0	SCHÖNBERGER, 1978, Taf.24,B200
10a	?	Hüfingen	63.0	REVILLIO, 1929, Abb.2,10
11a	3c	Canterbury	57.5	HASSALL, 1980, Fig.4,B
11a	2d	Kempton	33.0	MACKENSEN, 1987, Abb.66,12
11a	6a	Neuß	34.0	LEHNER, 1904, Taf.XXXA.9
12a	2e	Castleford	40.0	Report forthcoming
12a	3e	Castleford	41.0	Report forthcoming
12b	1b	Casterly Camp	27.0	GRIFFITHS, 1983, No.3



(scale in mm)  
**Fig.42: Type sketches (functional) for phalerae, Types 4-7**



**Fig.43:** Type sketches for pendants, Types 1a-t.



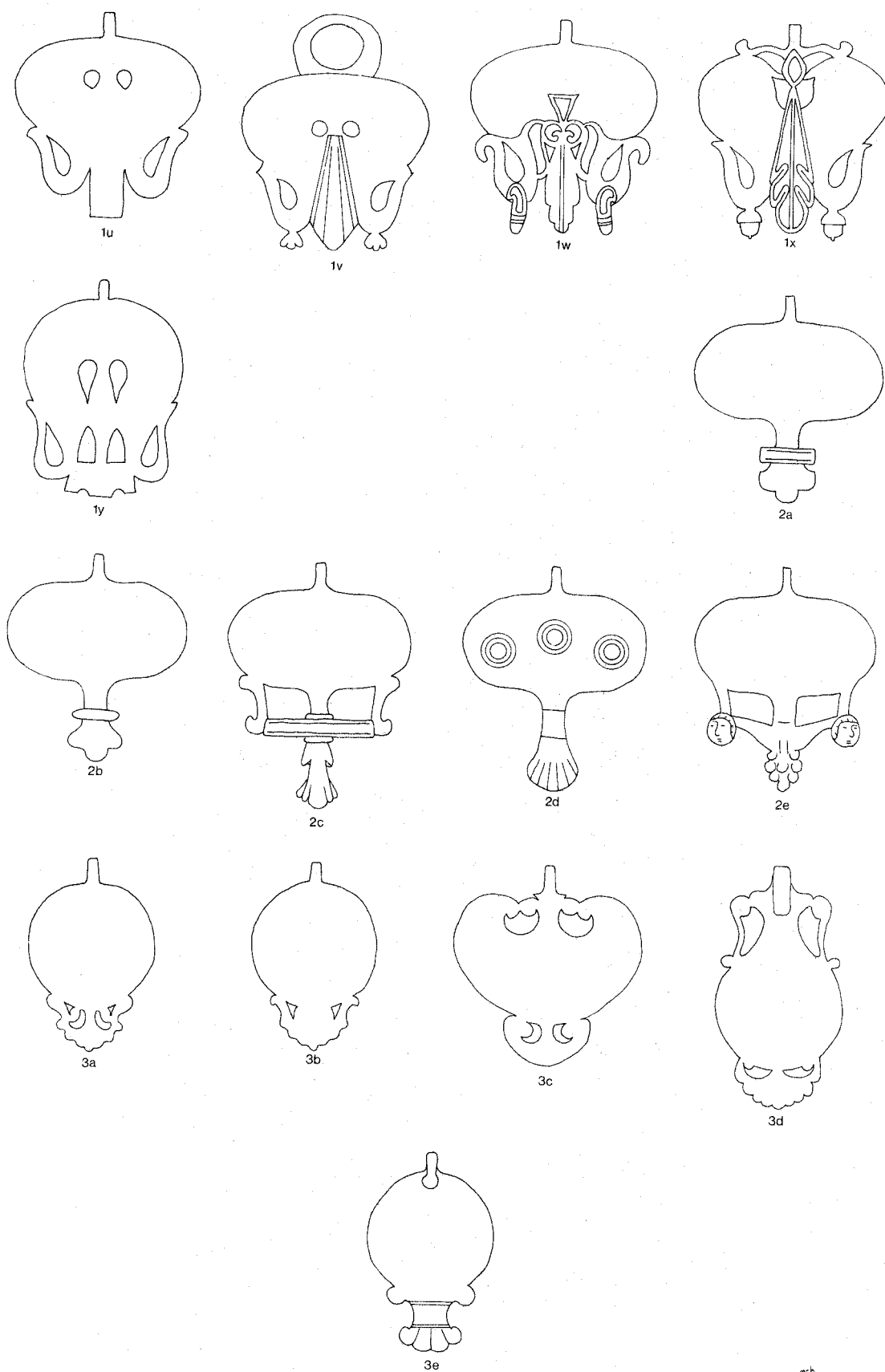
## PENDANTS

Type	Site	Width( mm)	Height( mm)	Reference
1a	Doorwerth	120.0	145.0	BROUWER, 1982, Nr.138
1a	Doorwerth	120.0	139.0	<u>Ibid.</u> , Nr.139
1a	Doorwerth	73.0	89.0	<u>Ibid.</u> , Nr.140
1a	Doorwerth	70.0	91.0	<u>Ibid.</u> , Nr.141
1a	Doorwerth	70.0	93.0	<u>Ibid.</u> , Nr.142
1a	Doorwerth	70.0	94.0	<u>Ibid.</u> , Nr.143
1a	Doorwerth	70.0	94.0	<u>Ibid.</u> , Nr.144
1a	Doorwerth	74.0	94.0	<u>Ibid.</u> , Nr.145
1a	Doorwerth	74.0	92.0	<u>Ibid.</u> , Nr.146
1a	Doorwerth	71.0	88.0	<u>Ibid.</u> , Nr.147
1a	Doorwerth	73.0	88.0	<u>Ibid.</u> , Nr.148
1a	Doorwerth	70.0	90.0	<u>Ibid.</u> , Nr.149
1a	Doorwerth	70.0	88.0	<u>Ibid.</u> , Nr.150
1a	Doorwerth	72.0	80.0	<u>Ibid.</u> , Nr.151
1a	Doorwerth	74.0	86.0	<u>Ibid.</u> , Nr. 152
1a	Doorwerth	72.0	88.0	<u>Ibid.</u> , Nr.153
1a	Doorwerth	72.0	89.0	<u>Ibid.</u> , Nr.154
1a	Doorwerth	73.0	87.0	<u>Ibid.</u> , Nr.155
1a	Doorwerth	73.0	87.0	<u>Ibid.</u> , Nr.156
1a	Doorwerth	73.0	82.0	<u>Ibid.</u> , Nr.157
1a	Doorwerth	71.0	87.0	<u>Ibid.</u> , Nr.158
1a	Doorwerth	72.0	85.0	<u>Ibid.</u> , Nr.159
1a	Doorwerth	72.0	91.0	<u>Ibid.</u> , Nr.160
1a	Doorwerth	73.0	81.0	<u>Ibid.</u> , Nr.161
1a	Doorwerth	75.0	86.0	<u>Ibid.</u> , Nr.162
1a	Doorwerth	73.0	80.0	<u>Ibid.</u> , Nr.163
1a	Doorwerth	74.0	84.0	<u>Ibid.</u> , Nr.164
1a	Doorwerth	72.0	81.0	<u>Ibid.</u> , Nr.165
1a	Doorwerth	70.0	88.0	<u>Ibid.</u> , Nr.166
1a	Doorwerth	73.0	84.0	<u>Ibid.</u> , Nr.167
1a	Doorwerth	71.0	90.0	<u>Ibid.</u> , Nr.168
1a	Doorwerth	74.0	88.0	<u>Ibid.</u> , Nr.169
1a	Doorwerth	73.0	79.0	<u>Ibid.</u> , Nr.170
1a	Doorwerth	73.0	83.0	<u>Ibid.</u> , Nr.171
1a	Doorwerth	70.0	88.0	<u>Ibid.</u> , Nr.172
1a	Xanten	108.5	128.0	JENKINS, 1985, No.A1
1b	Doorwerth	110.0	134.0	BROUWER, 1982, Nr.176
1b	Lincoln	52.5	52.0	WEBSTER, 1949, Pl.X,b (height damaged)
1b	The Lunt	56.5	50.0	HOBLEY, 1973, Fig.23,30 (height damaged)
1b	Xanten	62.0	82.0	JENKINS, 985, No.B5
1b	Xanten	62.0	80.0	<u>Ibid.</u> , No.B6
1b	Xanten	54.0	58.5	<u>Ibid.</u> , No.B7 (height damaged)
1b	Xanten	58.5	?	<u>Ibid.</u> , No.B8 (height damaged)
1b	Xanten	57.0	77.5	<u>Ibid.</u> , No.B9
1b	Xanten	62.5	81.5	<u>Ibid.</u> , No.B10
1b	Xanten	64.0	80.5	<u>Ibid.</u> , No.B11
1b	Xanten	62.0	67.0	<u>Ibid.</u> , No.B13 (height damaged)
1b	Xanten	62	65.5	<u>Ibid.</u> , No.B14 (height damaged)
1b	Xanten	60.0	62.0	<u>Ibid.</u> , No.B15 (height damaged)
1b	Xanten	60.5	63.0	No.B17 (height damaged)
1b	Xanten	62.0	62.0	<u>Ibid.</u> , No.B19 (height damaged)
1b	Xanten	60.0	?	<u>Ibid.</u> , No.B20 (height damaged)
1b	Xanten	61	79.0	<u>Ibid.</u> , No.B21
1b	Xanten	60.0	61.5	<u>Ibid.</u> , No.B24 (damaged)
1b	Xanten	60.0	63.5	<u>Ibid.</u> , No.B25 (damaged)
1c	Doorwerth	46.0	53.0	BROUWER, 1982, Nr.179
1c	Doorwerth	46.0	54.0	<u>Ibid.</u> , Nr.180
1c	Doorwerth	45.0	53.0	<u>Ibid.</u> , Nr.181

**Table 6**

1c?	Heddernheim	45.0	38.5	FISCHER, 1973, Abb.26,4 (height damaged)
1d	Doorwerth	80.0	101.0	BROUWER, 1982, Nr.183
1e	Banasa	42.0	55.0	BOUBE-PICCOT, 1964, No.4
1e	Colchester	55.5	61.5	WEBSTER, 1960, Fig.4,58
1e	Hofheim	?	?	Unpublished (Wiesbaden Stadtmuseum)
1e	Richborough	47.0	48.0	BUSHE-FOX, 1949, Pl.LI,180 (height damaged)
1e	Wiesbaden	49.0	51.0	ORL Nr.31, Taf.X,20
1f	Sea Mills	31.0	63.0	WEBSTER, 1960, Fig.7,181 (damaged)
1g	Aislingen	38.0	55.5	ULBERT, 1959, Taf.20,1
1g	Aislingen	36.0	41.0	<u>Ibid.</u> , Taf.20,2 (damaged)
1g	Chester	24.0	46.0	Unpublished (Grosvenor Museum 186.R.1976) (damaged)
1g	Corbridge	29.0	36.0	Allason-Jones in BISHOP & DORE, forthcoming, No.197 (damaged)
1g	Corbridge	42.0	44.0	<u>Ibid.</u> , No.198 (damaged)
1g	Dura-Europos	?	?	ROSTOVITZEFF et al., 19, Pl.VI,88
1g	Heddernheim	44.5	47.0	FISCHER, 1973, Abb.19,2 (damaged)
1g	Hüfingen	40.5	41.5	REVILLIO, 1929, Abb.2,5 (height obscured)
1g	Hüfingen	69.0	69.0	<u>Ibid.</u> , Abb.2,9 (height damaged)
1g	Hüfingen	45.0	55.5	ORL Nr.62a, Taf.XI,73 (height damaged)
1g	Kempten	33.0	48.0	MACKENSEN, 1987, Abb.66,13 (damaged)
1g	Mainz	45.5	55.0	BEHRENS, 1912, Abb.4,18 (height damaged)
1g	Neuß	60.0	74.0	LEHNER, 1904, Taf.XXXIV,6 (damaged)
1g	Newstead	75.0	82.0	CURLE, 1911, Pl.LXXIV,5 (damaged)
1g	Newstead	66.0	77.0	<u>Ibid.</u> , Pl.LXXIV,7 (damaged)
1g	Oberstimm	43.0	49.0	SCHONBERGER, 1978, Taf.24,B206 (height damaged)
1g	Riðtissen	37.0	35.0	ULBERT, 1970, Taf.1,15 (height damaged)
1g	Riðtissen	31.0	33.0	<u>Ibid.</u> , Taf.23,346 (damaged)
1g	Rottweil	36.0	46.0	PLANCK, 1975, Taf.35,1
1g	Rottweil	43.0	51.0	<u>Ibid.</u> , Taf.73,1 (height damaged)
1g	Rottweil	33.0	43.5	<u>Ibid.</u> , Taf.73,2 (height damaged)
1g	Sisek	37.0	49.0	HOFFILLER, 1912, SI.45
1g	Thamusida	46.0	40.0	BOUBE-PICCOT, 1964, No.5
1g	Vindonissa	33.0	41.0	UNZ, 1973, Abb.12,146
1g	Volubilis	66.0	45.0	<u>Ibid.</u> , No.6
1g	Volubilis	48.0	63.0	<u>Ibid.</u> , No.1
1g	Wroxeter	39.0	40.0	WEBSTER, 1960, Fig.8,260 (height damaged)
1h	Hod Hill	46.0	55.5	RICHMOND, 1968, Fig.31,"Pit 15b Secondary"
1h	Hüfingen	48.0	49.5	ORL Nr.62a, Taf.XI,72 (height obscured)
1h	Sheepen	34.0	36.0	HAWKES & HULL, 1947, Pl.CIII.22 (height obscured)
1i	Brecon	46.0	49.0	WHEELER, 1926, Fig.57,2 (damaged)
1i	Newstead	60.5	64.0	CURLE, 1911, Pl.LXXIII,3 (height damaged)
1j	Newstead	55.0	55.0	<u>Ibid.</u> , Pl.LXXIII,2 (height damaged)
1j	Newstead	54.0	54.0	<u>Ibid.</u> , Pl.LXXIII,4 (height damaged)
1k	Fremington Hagg	55.5	72.5	WEBSTER, 1971, No.1
1l	Fremington Hagg	37.0	48.0	<u>Ibid.</u> , No.2
1l	Greensforge	42.0	51.0	<u>Id.</u> , 1981, Fig.34 (height damaged)
1l	Hofheim	38.0	43.0	RITTERLING, 1913, Taf.XII,37 (height damaged)
1l	Hüfingen	46.5	46.0	REVILLIO, 1929, Abb.2,6 (damaged & obscured)
1l	Neuß	44.0	40.0	LEHNER, 1904, Taf.XXXIV,16 (height

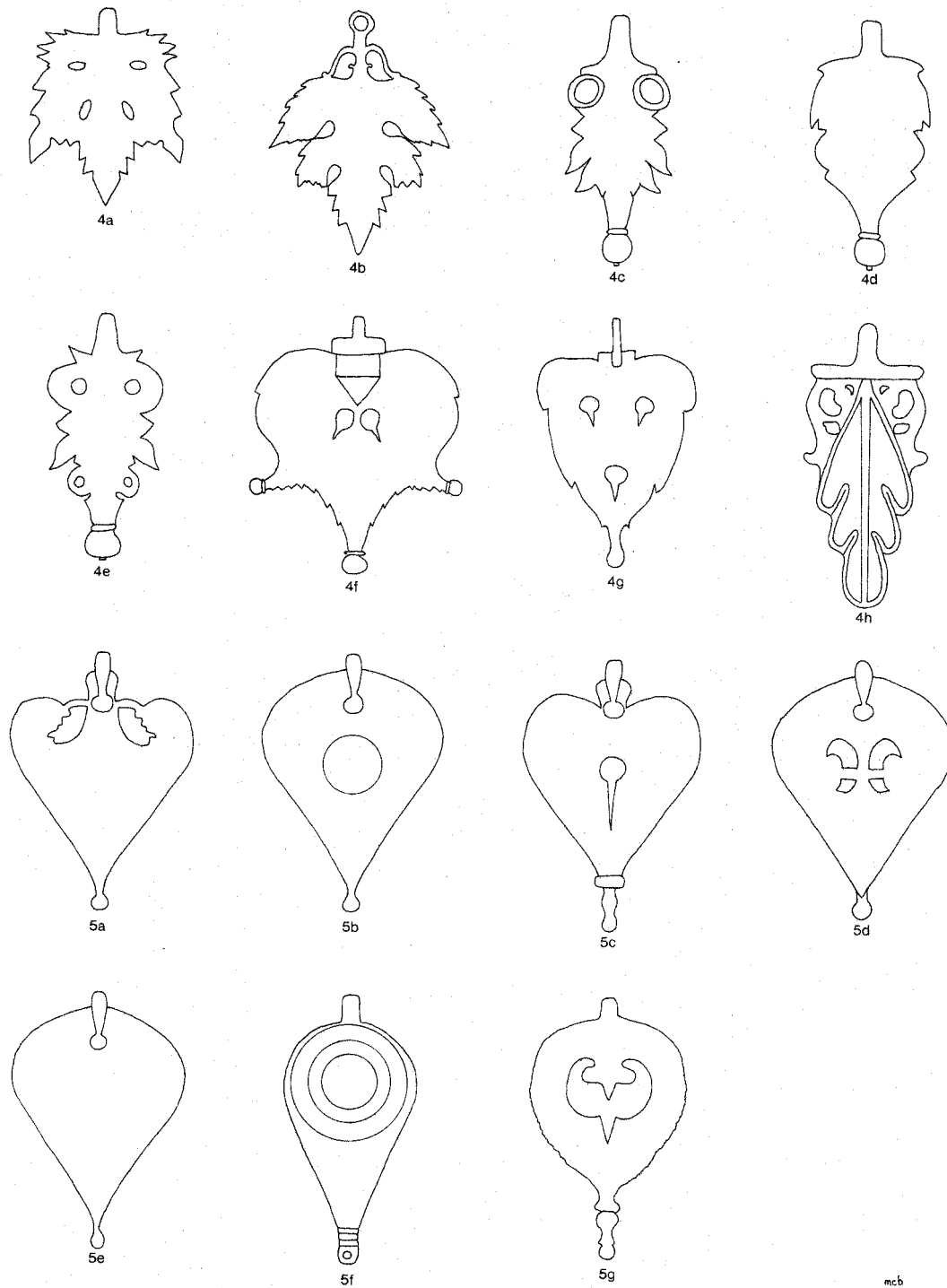
Table 6



**Fig.44:** Type sketches for pendants, Types 1u-3.

				obscured
1l	Oberstimm	37.0	44.0	ULBERT, 1957, Abb.2,4 (height damaged)
1l	Riðtissen	36.0	32.0	<u>Id.</u> , 1959, Taf.63,19 (height damaged)
1l	Valkenburg	40.0	47.0	GLASBERGEN & GROENMAN-VAN WAATERINGE, 1974, Pl.16,4
1l	Volubilis	40.0	34.0	BOUBE-PICCOT, 1964, No.12
1l	Volubilis	30.0	39.0	<u>Ibid.</u> , No.8
1l	Wiesbaden	45.0	51.0	ORL Nr.31, Taf.X,22
1m	Fremington Hagg	41.0	44.0	WEBSTER, 1971, No.18
1m	Tanger	52.0	71.0	BOUBE-PICCOT, 1964, No.10
1n	Hofheim	?	?	Unpublished (Wiesbaden Stadtmuseum)
1n	The Lunt	57.5	62.5	HOBLEY, 1973, Fig.22,20
1n	Seven Sisters	50.0	53.5	DAVIES & SPRATLING, 1976, No.3 (height damaged)
1n	Wroxeter	58.0	62.0	BUSHE-FOX, 1915, Fig.7,22
1n	Wroxeter	46.5	43.0	<u>Ibid.</u> , Pl.XVIII,30 (height damaged)
1o	Neuß	97.0	94.0	LEHNER, 1904, Taf.XXXIV,17
1o	Wiesbaden	42.0	44.0	ORL Nr.31, Taf.X,21
1p	Wiesbaden	40.0	44.0	<u>Ibid.</u> , Taf.X,24 (height damaged)
1q	Neuß	57.0	71.5	LEHNER, 1904, Taf.XXXIV,18 (height damaged)
1r	Neuß	48.5	53.0	<u>Ibid.</u> , Taf.XXXIV,19 (damaged)
1s	Thamusida	50.0	45.0	BOUBE-PICCOT, 1964, No.3
1t	Banasa	25.0	28.0	<u>Ibid.</u> , No.9
1u	Volubilis	63.0	52.0	<u>Ibid.</u> , No.11
1v	Cirencester	65.0	75.0	WACHER & MCWHIRR, 1982, Fig.35,98 (height damaged)
1w	Nawa	?	?	BOUBE-PICCOT, 1964, Pl.III
1x	Southwark	?	?	HAMMERSON & SHELDON, 1987, Pl.2
1y	Wroxeter	59.0	86.0	<u>West Midlands Archaeological News Sheet</u> No.17, 1974, front cover
2a	Alise-Saint-Reine	44.0	89.0	RABEISEN & MENU, 1985, Fig.5,27 (unfinished?)
2a	Baden	40.0	49.0	UNZ, 1971, Abb.6,49 (height damaged)
2a	Baden	41.0	48.0	<u>Ibid.</u> , Abb.6,50
2a	Doorwerth	91.0	88.0	BROUWER, 1982, Nr.187
2a	Doorwerth	46.0	42.0	<u>Ibid.</u> , Nr.191 (height damaged)
2a	Doorwerth	55.0	52.0	<u>Ibid.</u> , Nr.192
2a	Edington	41.5	47.5	GRIFFITHS, 1983, No.13
2a	Fremington Hagg	77.0	75.0	WEBSTER, 1971, No.19
2a	Hofheim	46.0	48.0	RITTERLING, 1913, Taf.XIV,2
2a	Kelvedon	51.0	50.0	WICKENDEN, this vol., Fig.5,28 (height damaged)
2a	Lixus	35.0	37.0	BOUBE-PICCOT, 1964, No.14
2a	Nawa	?	?	<u>Ibid.</u> , Pl.V
2a	Riðtissen	57.0	64.0	ULBERT, 1959, Taf.63,17
2a	Sheepen	51.0	58.0	HAWKES & HULL, 1947, Pl.CIII,13
2a	Thamusida	45.0	49.0	BOUBE-PICCOT, 1964, No.13
2a	Valkenburg	47.0	48.0	GLASBERGEN & GROENMAN-VAN WAATERINGE, 1974, Pl.16,3
2a	Wanborough	46.5	50.0	ANDERSON & WACHER, 1980, Fig.4,1 (height damaged)
2a	Wiesbaden	48.0	48.0	ORL Nr.31, Taf.X,26 (height damaged)
2b	Cirencester	48.0	45.0	WACHER & MCWHIRR, 1982, Fig.35,97 (height damaged)
2b	Fremington Hagg	45.0	45.0	WEBSTER, 1971, No.20 (height damaged)
2b	Oberstimm	50.0	33.0	SCHÖNBERGER, 1978, Taf.24,B205 (height damaged)
2b	Riðtissen	35.0	20.0	ULBERT, 1970, Taf.1,16 (height damaged)

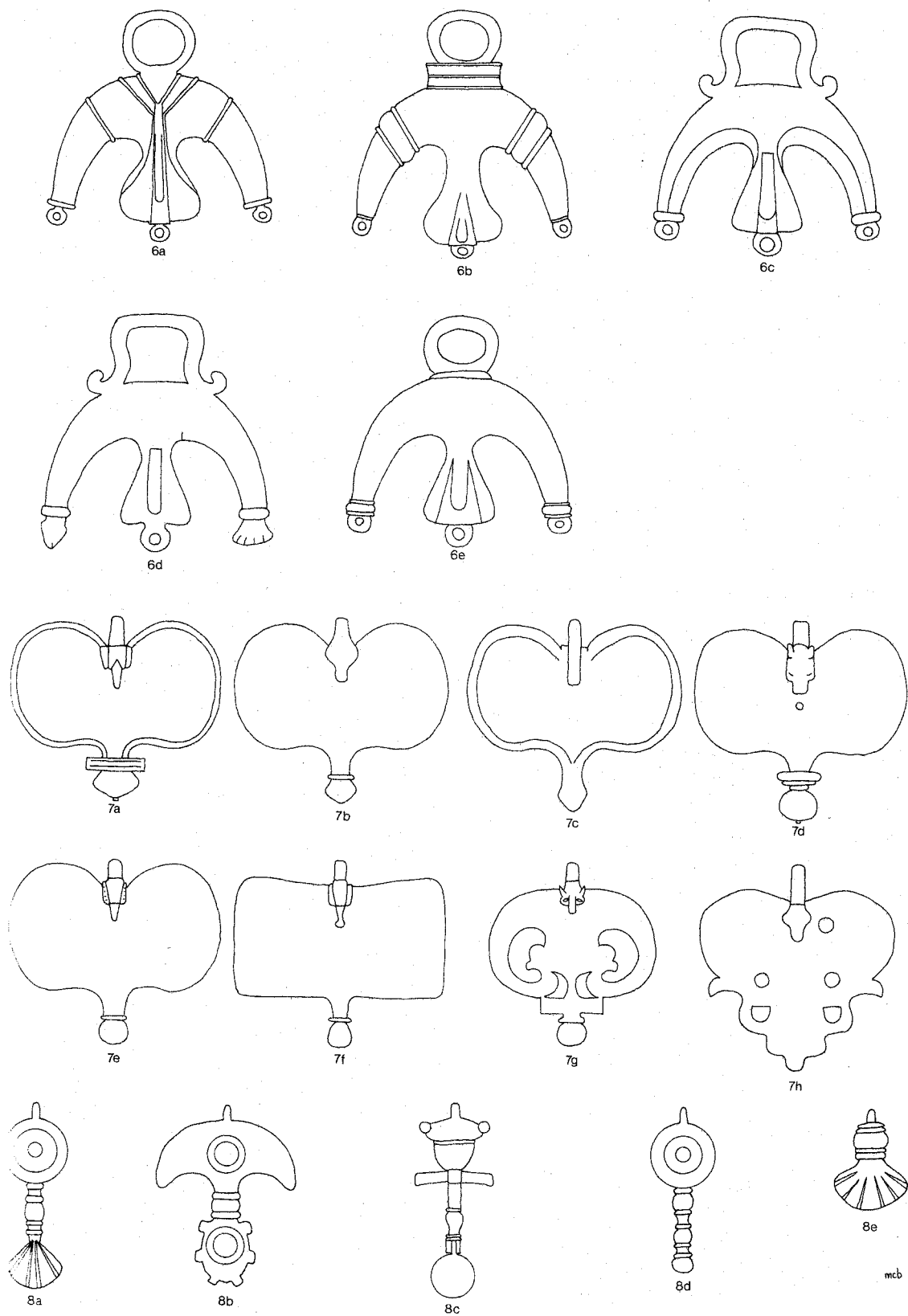
Table 6



**Fig.45:** Type sketches for pendants, Types 4-5.

2b	Riðtissen	31.0	34.5	<u>Ibid.</u> , Taf.23,348 (height damaged)
2c	Baden	38.0	57.0	UNZ, 1971, Abb.6,51
2d	Canterbury	65.0	47.0	HASSALL, 1980, Fig.4,A (height damaged)
2d	Canterbury	71.0	84.0	<u>Ibid.</u> , Fig.4,C
2e	Chester	50.0	49.0	Unpublished (Grosvenor Museum 185.R.1976) (height damaged)
3a	Doorwerth	46.0	69.0	BROUWER, 1982, Nr.281
3a	Dura-Europos			ROSTOVITZ et al., 19 , Pl.VII,92
3b	Hüfingen	61.0	99.0	ORL Nr.62a, Taf.XI,75
3b	Newstead	37.0	63.0	CURLE, 1911, Pl.LXXXI,3 (height damaged)
3b	Roanne	27.0	45.0	FEUGÈRE, 1983, Fig.26,60
3c	Baden	40.0	42.0	UNZ, 1971, Abb.6,55 (height damaged)
3c	Baden	39.0	51.0	<u>Ibid.</u> , Abb.6,56
3c	Baden	40.0	43.0	<u>Ibid.</u> , Abb.6,57 (height damaged)
3c	Baden	47.0	54.0	<u>Ibid.</u> , Abb.6,58
3c	Baden	22.0	24.0	<u>Ibid.</u> , Abb.6,59 (height damaged)
3c	Petronell	30.5	42.0	STIGLITZ, 1986, Taf.5,13
3c	Petronell	31.5	46.0	<u>Ibid.</u> , Taf.5,14
3c	Rottweil	48.0	58.5	PLANCK, 1975, Taf.35,5 (height damaged)
3c	Sisek	36.0	45.0	HOFFILLER, 1912, Sl.45
3c	Sisek	26.0	40.0	<u>Ibid.</u> , Sl.45
3d	Vindonissa	26.0	50.0	UNZ, 1973, Abb.12,145
3d	Vindonissa	31.0	60.0	<u>Ibid.</u> , Abb.12,150
3e	Petronell	30.0	52.5	STIGLITZ, 1986, Taf.5,1
4a	Colchester	58.0	65.0	WEBSTER, 1960, Fig.4,59
4a	Hofheim	70.0	70.0	RITTERLING, 1913, Taf.XIV,3 (damaged)
4b	Kenchester	54.0	81.0	WEBSTER, 1981, Fig.29
4b	Mainz	58.5	82.5	LAWSON, 1978, Taf.53,5
4b	Richborough	38.0	51.0	BUSHE-FOX, 1949, Pl.LVI,275
4b	Richborough	33.0	45.0	CUNLIFFE, 1968, Pl.XXXIX,147
4c	Rheingönheim	16.5	51.0	ULBERT, 1969, Taf.36,11
4d	Rheingönheim	33.0	54.0	<u>Ibid.</u> , Taf.36,12
4d	Rheingönheim	25.5	52.5	<u>Ibid.</u> , Taf.36,13
4e	Rheingönheim	22.5	46.5	<u>Ibid.</u> , Taf.36,14
4f	Mainz	65.0	90.0	BEHRENS, 1914, Abb.2,15 (width damaged)
4g	Rottweil	39.0	53.0	PLANCK, 1975, Taf.73,3
4h	Nawa	?	?	BOUBE-PICCOT, 1964, Pl.IV,2
5a	Baden	33.0	45.0	UNZ, 1974, Abb.1,8
5a	Colchester	37.5	60.0	WEBSTER, 1960, Fig.4,62 (width damaged)
5a	London	27.0	42.0	<u>Ibid.</u> , Fig.6,155
5a	Rottweil	70.5	64.5	PLANCK, 1975, Taf.73,10 (damaged)
5a	Sisek	40.0	42.5	HOFFILLER, 1912, Sl.45
5a	Vindonissa	22.0	41.0	UNZ, 1973, Abb.12,149 (height damaged)
5b	London	34.5	51.0	WEBSTER, 1960, Fig.6,143
5b	Rottweil	30.0	43.0	PLANCK, 1975, Taf.35,3 (damaged)
5c	Chester	33.5	53.5	NEWSTEAD, 1928, Pl.VII,11
5c	Neuß	34.0	64.0	LEHNER, 1904, Taf.XXXIV,12
5c	Petronell	30.5	45.0	STIGLITZ, 1986, Taf.5,6 (damaged)
5c	Straubing	43.5	61.5	WALKE, 1965, Taf.98,36
5c	Wroxeter	52.5	75.0	WEBSTER, 1960, Fig.8,261 (height damaged)
5d	Sheepen	45.0	56.0	HAWKES & HULL, 1947, Pl.CIII,10 (height damaged)
5e	Castleford	19.0	46.0	Report forthcoming
5e	Chester	16.0	37.5	NEWSTEAD, 1928, Pl.VII,7
5e	Chester	24.0	42.0	<u>Ibid.</u> , Pl.VII,8 (height damaged)
5e	Chester	26.5	39.0	<u>Ibid.</u> , Pl.VII,9 (height damaged)

**Table 6**



**Fig.46:** Type sketches for pendants, Types 6-8e.

5e	Chester	23.0	37.0	<u>Ibid.</u> , Pl.VII,10
5e	Chester	30.0	50.0	<u>Ibid.</u> , Pl.VII,12 (height damaged)
5e	Hofheim	23.0	41.0	RITTERLING, 1904, Taf.III,31
5e	Hofheim	38.0	69.0	<u>Ibid.</u> , Taf.III,32 (damaged)
5e	Hüfingen	42.0	57.0	ORL Nr.62a, Taf.XI,78
5e	Hüfingen	64.5	94.5	<u>Ibid.</u> , Taf.XI,79 (damaged)
5e	Hüfingen	39.0	60.0	<u>Ibid.</u> , Taf.XI,80
5e	Hüfingen	36.0	60.0	<u>Ibid.</u> , Taf.XI,83
5e	Neuß	77.0	115.0	LEHNER, 1904, Taf.XXXIV,9
5e	Rottweil	65.0	97.5	PLANCK, 1975, Taf.35,6
5e	Rottweil	54.0	71.0	<u>Ibid.</u> , Taf.73,4
5e	Rottweil	54.0	79.5	<u>Ibid.</u> , Taf.73,6
5e	Rottweil	81.0	109.5	<u>Ibid.</u> , Taf.73,9
5e	Rottweil	33.0	51.0	<u>Ibid.</u> , Taf.73,8
5e	Strasbourg	28.5	52.5	FORRER, 1927, Taf.LXXVII,14
5e	Unknown	49.0	76.0	LAWSON, 1978, Taf.53,4
5e	Vindonissa	39.0	60.0	UNZ, 1973, Abb.11,128 (width damaged)
5e	Vindonissa	40.0	65.0	<u>Ibid.</u> , Abb.11,131
5e	Wiesbaden	40.0	62.0	ORL Nr.31, Taf.X,37
5e	Wiesbaden	66.0	91.0	<u>Ibid.</u> , Taf.X,40
5f	Lorenzberg	42.0	81.0	ULBERT, 1965, Taf.2,14
5g	Heddernheim	42.0	66.0	FISCHER, 1973, Abb.17,1
6a	Colchester	64.0	61.5	WEBSTER, 1960, Fig.5,83 (damaged)
6b	Valkenburg	76.0	84.0	GLASBERGEN & GROENMAN-VAN WAATERINGE, 1974, Pl.15,3 (width damaged)
6b	Wall	69.0	63.0	WEBSTER, 1960, Fig.8,224 (height damaged)
6c	Chester	57.5	64.5	GREEN, 1984, Pl.144
6c	Chisbury	53.5	75.5	GRIFFITHS, 1983, No.6 (damaged)
6c	Hod Hill	62.5	52.5	BRAILSFORD, 1962, Fig.3,A45 (height damaged)
6c	Hofheim	64.0	53.0	RITTERLING, 1913, Taf.XIV,1 (height damaged)
6c	Mainz	59.0	60.0	BEHRENS, 1918, Abb.10,3
6c	Vindonissa	47.0	44.0	UNZ, 1973, Abb.13,162 (height damaged)
6d	Sheepen	56.0	38.0	HAWKES & HULL, 1947, Pl.CIII,17 (height damaged)
6e	Mainz	68.0	55.0	BEHRENS & BRENNER, 1911, Abb.26,105 (damaged)
6e	Strasbourg	48.0	59.0	FORRER, 1927, Fig.435
7a	Aislingen	12.0	22.5	ULBERT, 1959, Taf.20,8 (damaged)
7a	Ashdon	63.5	62.0	WICKENDON, this vol., Pl.2 (width damaged)
7a	Baden	61.0	58.0	UNZ, 1971, Abb.5,46
7a	Baden	50.0	60.0	<u>Ibid.</u> , Abb.5,47 (width damaged)
7a	Baden	43.0	41.0	<u>Id.</u> , 1974, Abb.1,9
7a	Besançon	46.0	40.0	FEUGÈRE, 1983, Fig.23,b
7a	Cirencester	53.5	51.0	WACHER & MCWHIRR, 1982, Fig.36,101 (width damaged)
7a	Ham Hill	52.5	34.5	WEBSTER, 1960, Fig.5,122 (damaged)
7a	Hofheim	56.0	42.0	RITTERLING, 1913, Taf.XIV,4
7a	Kingsholm	44.5	46.5	<u>Ibid.</u> , Fig.11,2
7a	Normanby	45.0	56.0	LEAHY, 1980, Fig.9
7a	Riðitissen	55.0	35.0	ULBERT, 1970, Taf.23,345 (height damaged)
7a	Roanne	57.0	35.0	FEUGÈRE, 1983, Fig.23,58
7a	Southwark	54.0	49.5	<u>Rescue News</u> 33, Spring 1984; HAMMERSON & SHELDON, 1987, Pl.1
7a	Stadtbergen	60.0	52.5	MACKENSEN, 1987, Abb.64,12
7a	Vindonissa	43.0	40.0	UNZ, 1973, Abb.11,124
7a	Vindonissa	51.0	42.0	<u>Ibid.</u> , Abb.11,125

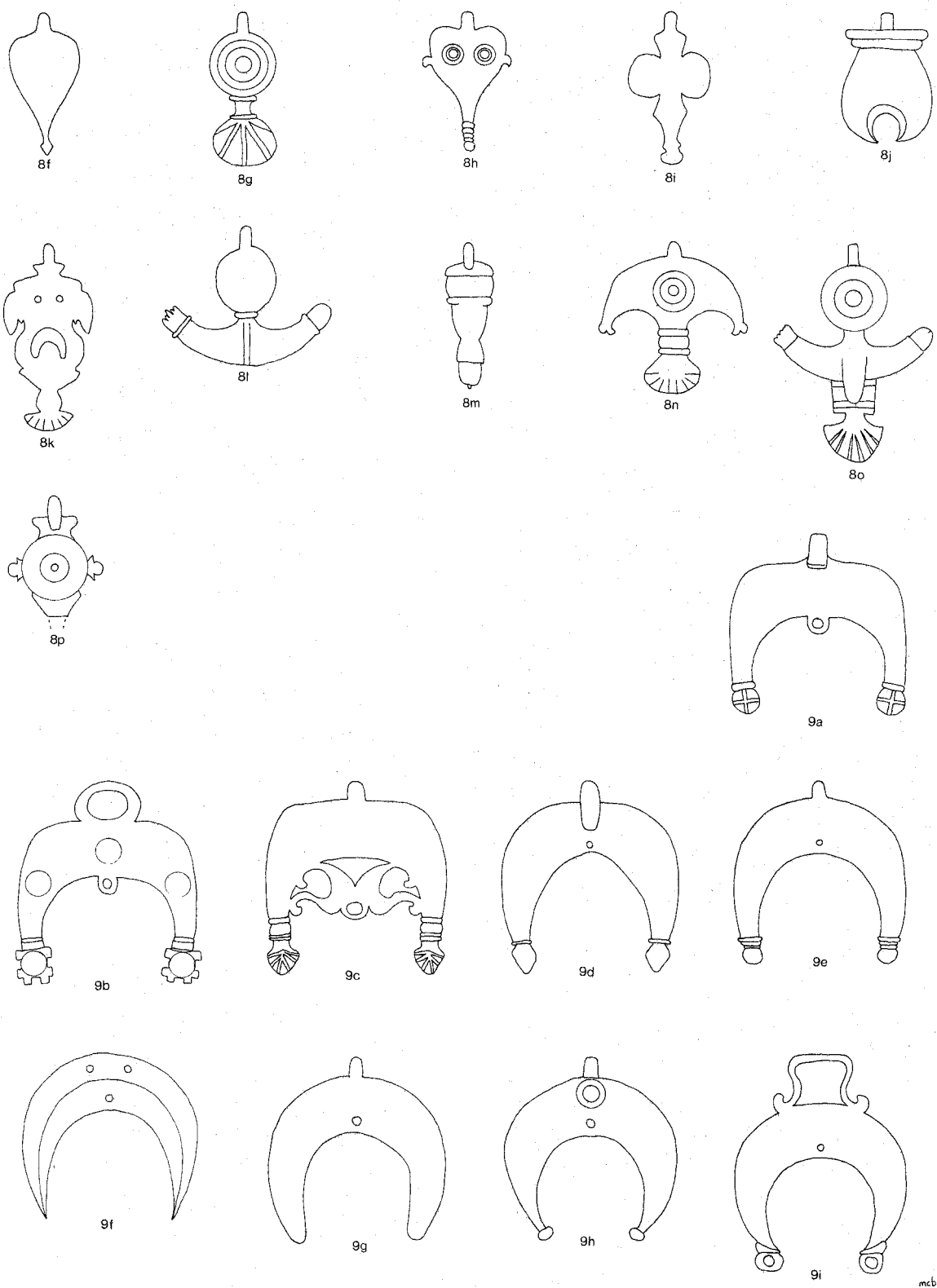
**Table 6**



7a	Wroxeter	82.5	40.0	WEBSTER, 1960, Fig.8,263 (height damaged)
7b	Aislingen	36.0	46.5	ULBERT, 1959, Taf.20,3 (width damaged)
7b	Baden	50.0	44.0	UNZ, 1971, Abb.7,68 (height damaged)
7b	Baden	53.0	48.0	<u>Ibid.</u> , Abb.7,69
7b	Baden	60.0	59.0	<u>Id.</u> , 1974, Abb.1,10 (height damaged)
7b	Baden	46.0	42.0	<u>Ibid.</u> , Abb.1,11 (height damaged)
7b	Bern	50.0	39.0	MÜLLER-BECK & ETTLINGER, 1963, Taf.5 7,4 (height damaged)
7b	Bern	51.0	51.0	<u>Ibid.</u> , Taf.57,5
7b	Besançon	102.5	78.5	FEUGÈRE, 1983, Fig.25,a
7b	Bregenz	51.0	52.5	MACKENSEN, 1987, Abb.64,7 (width damaged)
7b	Bregenz	64.5	51.0	<u>Ibid.</u> , Abb.64,8
7b	Chichester	50.0	46.5	DOWN, 1978, Fig.10.32,42 (width damaged)
7b	Chichester	51.0	43.5	<u>Ibid.</u> , Fig.10.32,43 (height damaged)
7b	Colchester	38.0	47.5	CRUMMY, 1983, No.4233 (width damaged)
7b	Harlow	30.0	39.0	WICKENDEN, this vol., Fig.6,39 (width damaged)
7b	Hod Hill	45.0	45.0	BRAILSFORD, 1962, Fig.3,A40
7b	Hofheim	52.0	38.0	RITTERLING, 1913, Taf.XIV,7 (damaged)
7b	Hofheim	42.0	36.0	<u>Ibid.</u> , Taf.XIV,9 (damaged)
7b	Hofheim	38.0	35.0	<u>Ibid.</u> , Taf.XIV,10 (height damaged)
7b	Hüfingen	39.0	42.0	ORL Nr.62a, Taf.XI,87 (damaged)
7b	London	55.5	46.5	WEBSTER, 1960, Fig.6,144
7b	Longthorpe	52.5	50.5	FRERE & ST.JOSEPH, 1974, Fig.30,62
7b	Luxeuil	58.0	51.0	FEUGÈRE, 1983, Fig.25,b
7b	Mainz			BEHRENS & BRENNER, 1911, Abb.26,104 (height damaged)
		55.0	54.0	
7b	Neuß	78.0	68.0	LEHNER, 1904, Taf.XXXIV,10
7b	Oberstimm	74.0	66.0	ULBERT, 1957, Abb.2,6 (height damaged)
7b	Rheingönheim	48.0	48.0	ULBERT, 1969, Taf.36,1 (width damaged)
7b	Rheingönheim	44.0	42.0	<u>Ibid.</u> , Taf.36,2
7b	Rheingönheim	52.5	41.0	<u>Ibid.</u> , Taf.36,4 (damaged)
7b	Rißtissen	38.0	47.0	<u>Id.</u> , 1970, Taf.33,507 (width damaged)
7b	Rißtissen	50.0	52.0	<u>Ibid.</u> , Taf.33,508 (width damaged)
7b	Roanne	41.0	40.5	FEUGÈRE, 1983, Fig.24
7b	Sheepen	63.0	64.0	HAWKES & HULL, 1947, Pl.CIII,12
7b	Strasbourg	52.5	40.5	FORRER, 1927, Taf.LXXVII,16 (damaged)
7b	Unknown	118.0	95.0	LAWSON, 1978, Taf.53,2
7b	Valkenburg			GLASBERGEN & GROENMAN-VAN WAATERINGE, 1974, Pl.14,52
		74.0	66.0	
7b	Valkenburg	44.0	43.0	<u>Ibid.</u> , Pl.16,6
7b	Vechten	40.0	38.0	FEUGÈRE, 1983, Fig.25,e (damaged)
7b	Vechten	39.5	48.0	<u>Ibid.</u> , Fig.25,f (damaged)
7b	Verulamium	63.0	55.0	<u>Ibid.</u> , Fig.25,c (width damaged)
7b	Vindonissa	44.0	44.0	UNZ, 1973, Abb.11,127 (width damaged)
7b	Vindonissa	51.0	45.0	<u>Ibid.</u> , Abb.11,129
7b	Xanten	72.0	105.0	HINZ, 1971, Abb.33,8 (height damaged)
7c	London	69.0	61.5	WEBSTER, 1960, Fig.6,161 (height damaged)
7d	Hofheim	53.0	51.0	RITTERLING, 1904, Taf.III,23
7d	Sheepen			HAWKES & HULL, 1947, Pl.CIII,11 (height damaged)
		48.0	45.0	
7e	Cirencester	182.0	128.0	WACHER & MCWHIRR, 1982, Fig.36,100
7e	Moers-Asberg	126.0	125.0	BECHERT, 1974, Abb.73,9

Decorated suspension necks for 7e pendants are known from Chelmsford (WICKENDEN, this vol., Fig.3,2); Colchester (WEBSTER, 1960, Fig.4,69); London (Ibid., Fig.6,141); Wroxeter (Ibid., Fig.8,256); Kingsholm (LYSONS, 1817, Pl.XV,10); Aislingen (ULBERT, 1959, Taf.21,17); Kempten (MACKENSEN, 1987, Abb.66,14); Oberstimm (SCHÖNBERGER, 1978, Taf.23,B189)

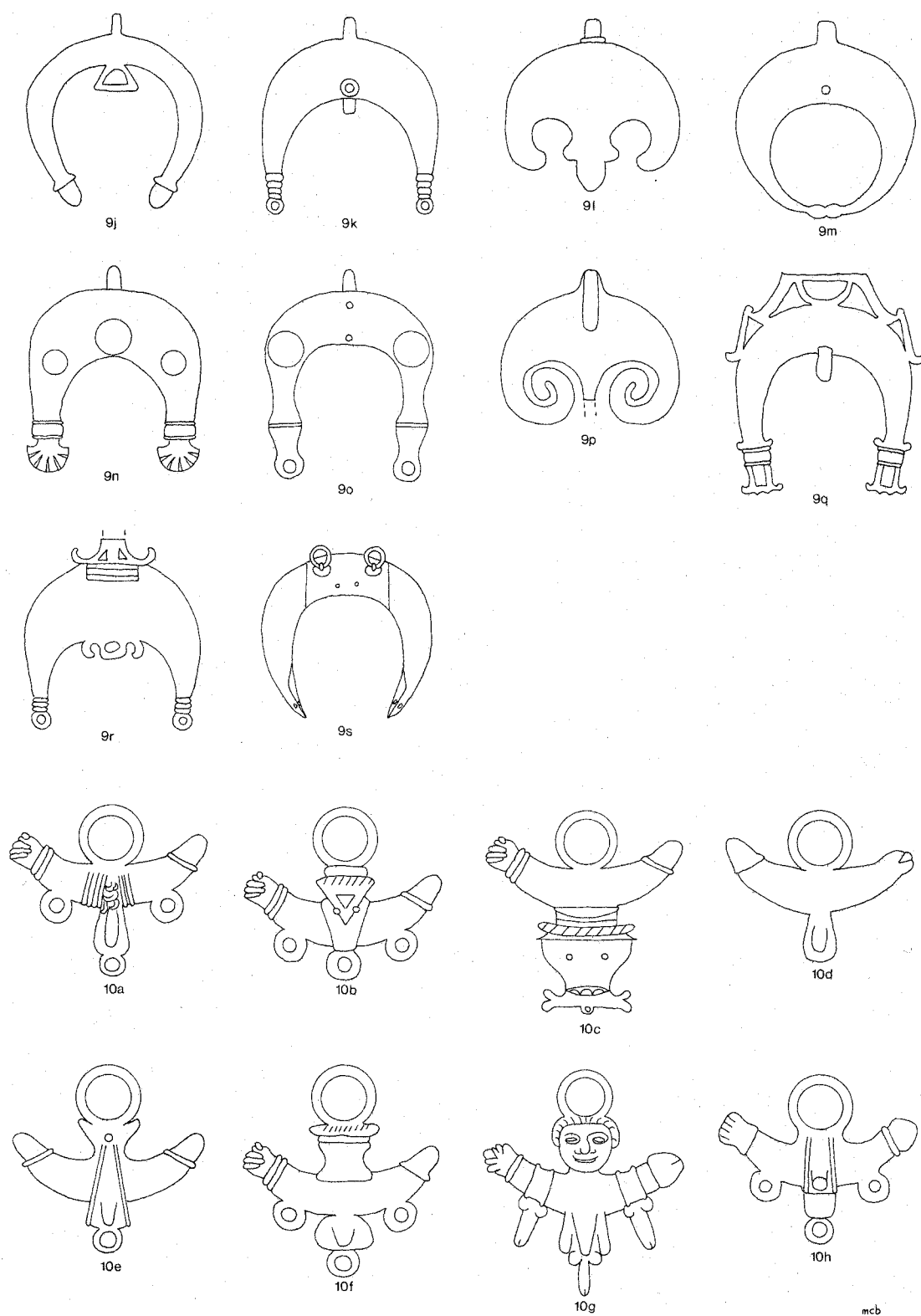
**Table 6**



**Fig.47:** Type sketches for pendants, Types 8f-9i.

7f	Strasbourg	108.0	108.0	FORRER, 1927, Fig.394,E
7f	Straubing	75.0	79.5	WALKE, 1965, Taf.98,38
7g	Neuß	?	?	LEHNER, 1904, Taf.XXXIV,14
7g	Unknown	39.0	37.0	AuhV 3:5, Taf.5,6 (damaged)
7g	Valkenburg	42.0	44.0	GLASBERGEN S, GROENMAN-VAN WAATERINGE, 1974, Pl.16,8
7h	Fingringhoe Wick	?	?	WEBSTER, 1981, 133 fig.
8a	Rißtissen	27.0	78.0	ULBERT, 1970, Taf.10,160
8b	Hod Hill	59.0	40.0	BRAILSFORD, 1962, Fig.3,A38
8b?	Baden	32.0	50.0	UNZ, 1974, Abb.1,14 (damaged)
8c	Hod Hill	43.0	74.5	BRAILSFORD, 1962, Fig.3,A39
8d	Hod Hill	30.5	60.0	Ibid., Fig.3,A48 (damaged)
8e	Richborough	36.0	21.0	BUSHE-FOX, 1949, Pl.LI,181
8f	Richborough	15.0	30.0	CUNLIFFE, 1968, Pl.XXXIX,146
8g	Ham Hill	18.0	43.0	GRAY, 1924, Pl.XIII,El5 (height damaged)
8h	Colchester	21.0	35.5	DUNNETT, 1971, Fig.11,17
8h	Rheingonheim	25.0	35.0	ULBERT, 1969, Taf.36,16
8i	Rheingonheim	17.0	34.0	Ibid., Taf.36,17
8j	Heerlen	19.0	31.0	ZADOKS-JOSEPHUS JITTA & WITTEVEEN, 1977, Pl.34,47
8j	Hüfingen	19.0	24.0	ORL Nr.62a, Taf.XI,81
8j	Nijmegen	16.0	22.5	ZADOKS-JOSEPHUS JITTA & WITTEVEEN, 1977, Pl.33,36
8j	Nijmegen	18.5	40.0	Ibid., Pl.34,37
8j	Vindonissa	22.0	36.0	UNZ, 1973, Abb.13,167
8k	Vindonissa	17.0	40.0	Ibid., Abb.12,152 (width damaged)
8k	Vindonissa	17.0	45.0	Ibid., Abb.12,153
8l	Vindonissa	30.0	30.0	Ibid., Abb.13,164
8m	Vindonissa	10.0	31.0	Ibid., Abb.13,165
8n	Friedberg-Rederzhausen	36.0	49.5	VON SCHNURBEIN, 1983, Abb.8,13 (width damaged)
8o	Friedberg	48.0	80.5	ORL Nr.26, Taf.V,3
8p	Wall	31.5	43.0	WEBSTER, 1958, Fig.5,1 (height damaged)
9a	Hod Hill	58.0	64.0	BRAILSFORD, 1962, Fig.3,A43
9b	Hod Hill	51.0	92.0	Ibid., Fig.3,A42 (width damaged)
9b	Nijmegen	79.0	90.0	ZADOKS-JOSEPHUS JITTA 5. WITTEVEEN, 1977, Pl.31,11
9b	Nijmegen	77.0	79.0	Ibid., Pl.31,12 (height damaged)
9c	Richborough	68.0	70.0	BUSHE-FOX, 1949, Pl.LI,181 (height damaged)
9d	Baden	62.0	67.0	UNZ, 1971, Abb.5,43 (height damaged?)
9d	Nijmegen?	65.0	65.0	ZADOKS-JOSEPHUS JITTA S. WITTEVEEN, 1977, Pl.33,28
9d	Richborough	48.5	48.0	CUNLIFFE, 1968, Pl.XXXIX,146
9d	Unknown	51.0	54.0	ZADOKS-JOSEPHUS JITTA & WITTEVEEN, 1977, Pl.30,7
9d	Unknown	67.0	57.0	Ibid., Pl.32,20
9d	Unknown	38.0	39.0	Ibid., Pl.32,22
9d	Unknown	37.0	36.5	Ibid., Pl.34,42
9d	Vechten	77.0	78.0	Ibid., Pl.33,30
9d	Vechten	45.0	41.0	Ibid., Pl.33,31
9d	Vechten	38.0	48.5	Ibid., Pl.33,32
9d	Vindonissa	55.0	50.0	UNZ, 1973, Abb.11,126 (width damaged)
9e	Augsburg-Oberhausen	36.0	37.0	HÜBENER, 1973, Taf.14,6
9e	Baden	63.0	82.0	UNZ, 1971, Abb.5,44
9e	Hofheim	54.0	62.0	RITTERLING, 1913, Taf.XIV,5
9e	Mainz	53.0	57.0	BEHRENS, 1914, Abb.2,16
9e	Rodgen	62.0	73.5	SCHÖNBERGER & SIMON, 1976, Taf.41,6

**Table 6**



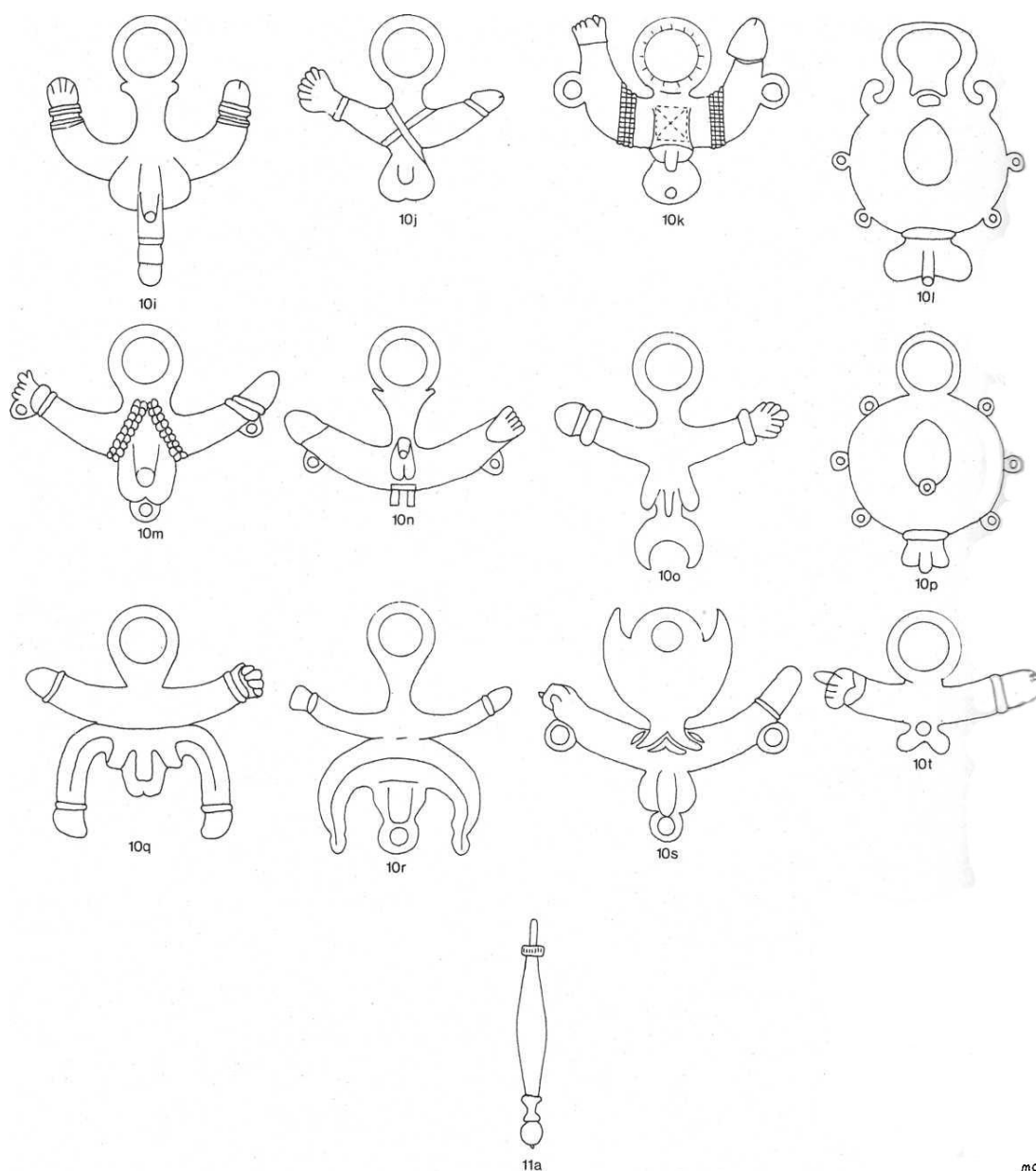
**Fig.48:** Type sketches for pendants, Types 9j-10h.

9e	Strasbourg	46.5	60.0	FORRER, 1927, Taf.LXXVII,15
9f	Burum	45.0	39.0	ZADOKS-JOSEPHUS JITTA & WITTEVEEN, 1977, Pl.30,9
9f	Ferwerd	50.0	43.0	<u>Ibid.</u> , Pl.30,8
9f	Piaam	46.0	40.0	<u>Ibid.</u> , Pl.30,10
9f	Unknown	37.0	40.0	<u>Ibid.</u> , Pl.30,1
9f	Unknown	47.0	41.0	<u>Ibid.</u> , Pl.30,6
9f	Wiesbaden	54.0	45.0	ORL Nr.31, Taf.X,41
9g	Castleford	54.0	57.0	Report forthcoming
9g	Castleford	48.0	43.0	Report forthcoming (height damaged)
9g	Corbridge	50.0	59.0	Allason-Jones in BISHOP & DORE, forthcoming. No.121 (damaged)
9g	Hüfingen	49.5	48.0	ORL Nr.62a, Taf.XI,81 (height damaged)
9g	Nijmegen	44.0	48.0	ZADOKS-JOSEPHUS JITTA & WITTEVEEN, 1977, Pl.33,36
9g	Nijmegen	43.0	71.5	<u>Ibid.</u> , Pl.34,37 (width damaged)
9g	Nijmegen?	56.0	56.0	<u>Ibid.</u> , Pl.34,38
9g	Vindonissa	60.0	63.0	UNZ, 1973, Abb.13,158
9g	Vindonissa	31.0	41.0	<u>Ibid.</u> , Abb.13,164
9h	Dormagen	54.0	66.0	MULLER, 1979, Taf.79,12
9h	Straubing	50.0	57.0	WALKE, 1965, Taf.98,28
9h	Unknown	40.0	41.0	ZADOKS-JOSEPHUS JITTA & WITTEVEEN, 1977, Pl.32,23
9h	Unknown	30.0	39.0	<u>Ibid.</u> , Pl.34,40
9h	Unknown	72.0	67.0	LAWSON, 1978, Taf.53,3
9h	Vechten	29.0	38.0	ZADOKS-JOSEPHUS JITTA & WITTEVEEN, 1977, Pl.33,33
9h	Waddon Hill	26.0	37.0	WEBSTER, 1960b, Fig.6,1
9i	Baden	36.0	54.0	UNZ, 1971, Abb.5,48 (height damaged)
9i	Neuß	37.0	57.0	LEHNER, 1904, Taf.XXXIV,23
9j	Nijmegen	39.0	46.0	ZADOKS-JOSEPHUS JITTA & WITTEVEEN, 1977, Pl.31,15 (height damaged)
9j	Vindonissa	31.0	47.0	<u>Id.</u> , 1973, Abb.13,165
9k	Haltern	63.0	71.5	MAKW 2, 120 Abb.
9l	Haltern	25.0	24.0	<u>Ibid.</u> , 120 Abb.
9m	Vechten	57.0	59.5	ZADOKS-JOSEPHUS JITTA & WITTEVEEN, 1977, Pl.30,4
9m	Voorburg	35.0	44.0	<u>Ibid.</u> , Pl.34,44
9n	Friedberg	71.0	121.0	ORL Nr.26, Taf.V,3 (width damaged)
9o	Colchester	53.0	72.0	DUNNETT, 1971, Fig.11,19
9p	Carnuntum	57.0	50.0	RLO XXXII, Taf.66,17 (height damaged)
9q	Rheinberg	51.0	51.0	BINDING, 1968, Abb.17 (height damaged?)
9r	Unknown	85.0	88.5	LAWSON, 1978, Taf.53,1 (height damaged)
9s	Dangstetten	150.0	138.0	FINGERLIN, 1981, Abb.5
10a	The Lunt	67.0	51.0	HOBLEY, 1969, Fig.20,6
10a	Rheingönheim	67.5	54.0	ULBERT, 1969, Taf.36,21
10b	Rheingönheim	70.5	45.0	<u>Ibid.</u> , Taf.36,20 (height damaged)
10c	Aislingen	66.0	70.0	<u>Id.</u> , 1959, Taf.20,9 (height damaged)
10d	Haltern	36.0	34.0	MAKW 2, 120 Abb.
10d	Oberaden	55.5	46.0	ALBRECHT, 1942, Taf.44,5
10e	Mainz	83.0	54.0	BEHRENS, 1912, Abb.4,1
10f	Mainz	90.0	62.0	<u>Ibid.</u> , Abb.4,2 (height damaged)
10g	Mainz	90.0	98.0	<u>Id.</u> , 1918, Abb.10,5
10h	Mainz	100.0	62.0	<u>Ibid.</u> , Abb.10,6 (height damaged)
10i	Rottweil	73.5	88.5	PLANCK, 1975, Taf.75,5
10j	Baden	70.0	52.0	UNZ, 1971, Abb.7,71
10k	Baden	62.0	55.0	<u>Ibid.</u> , Abb.7,72 (damaged)
10l	Chichester	47.5	70.0	DOWN, 1978, Fig.10.33,49
10l	Hofheim	45.0	53.0	RITTERLING, 1904, Taf.III,26 (height damaged)
10m	Augsburg- Oberhausen	79.0	50.0	HÜBENER, 1973, Taf.14,18

**Table 6**

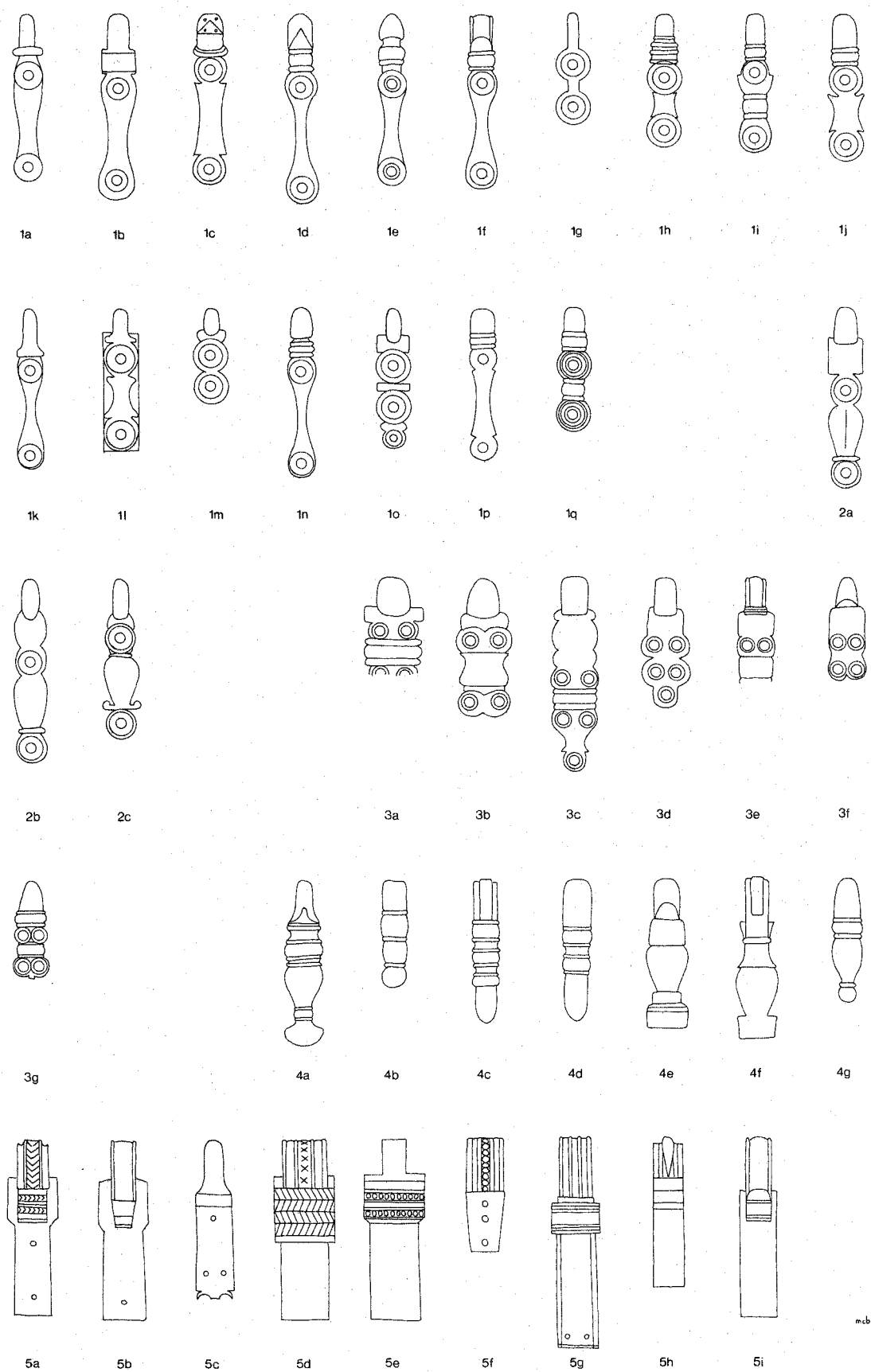
**Table 6**

10m	Nijmegen	79.0	50.0	ZADOKS-JOSEPHUS JITTA & WITTEVEEN, 1977, Pl.32,18
10m	Vindonissa	76.0	54.0	UNZ, 1973, Abb.13,160
10n	Vindonissa	72.0	71.0	<u>Ibid.</u> , Abb.13,163
10o	Valkenburg	81.0	62.0	GLASBERGEN & GROENMAN-VAN WAATERINGE, 1974, Pl.14,50 (height damaged)
10p	Valkenburg	64.0	87.0	<u>Ibid.</u> , Pl.15,9
10q	Augsburg-Oberhausen	60.0	59.0	HÜBENER, 1973, Taf.14,3
10r	Augsburg-Oberhausen	44.0	68.0	<u>Ibid.</u> , Taf.14,10
10s	Nijmegen	76.0	67.0	BOGAERS & HAALEBOS, 1975, Fig.11,5
10t	Nijmegen	97.0	64.0	<u>Ibid.</u> , Fig.11,6
11a	Rheingönheim	8.0	64.5	ULBERT, 1969, Taf.36,15



**Fig.49:** Type sketches for pendants, Types 10i-11

mcb



**Fig.50:** Type sketches for junction loops, Types 1-5.

## JUNCTION LOOPS

Type	Site	Length (mm)	Width (mm)	Reference
1a	Gloucester	50.0	9.0	WEBSTER, 1960, No.100
1b	Sea Mills	69.0	13.5	<u>Ibid.</u> , No.180 (length damaged)
1c	Castleford	57.0	15.0	Report forthcoming (length damaged)
1c	Corbridge	64.0	15.0	75.1344 (length damaged)
1c	Corbridge	47.0	13.0	75.1339 (damaged)
1c	Corbridge	40.0	18.0	Allason-Jones in BISHOP & DORE, forthcoming, No.123 (length damaged)
1c	Petronell	70.0	17.0	STIGLITZ, 1986, Taf.6,11 (length damaged)
1c	Petronell	66.0	14.5	<u>Ibid.</u> , Taf.6,12 (length damaged)
1c	South Shields	58.0	14.0	ALLASON-JONES & MIKET, 1984, 3.721
1c	Strasbourg	27.0	13.5	FORRER, 1927, Taf.LXXVII,2 (length damaged)
1c	Strasbourg	34.5	13.5	<u>Ibid.</u> , Taf.LXXVII,2 (length damaged)
1c	Strasbourg	55.0	15.0	<u>Ibid.</u> , Taf.LXXVII,2
1c	Strasbourg	37.5	13.5	<u>Ibid.</u> , Taf.LXXVII,2 (length damaged)
1c	Straubing	64.0	16.5	WALKE, 1965, Taf.99,4
1c	Straubing	73.5	19.0	<u>Ibid.</u> , Taf.99,5
1c	Verulamium	75.0	18.0	WEBSTER, 1960, No.202
1d	Birten	58.0	14.0	HINZ, 1971, Bild 12,16
1d	Birten	59.5	14.0	<u>Ibid.</u> , Bild 12,16
1d	Birten	56.5	14.0	<u>Ibid.</u> , Bild 12,16
1d	Birten	59.0	14.5	<u>Ibid.</u> , Bild 12,16
1d	Castleford	18.0	12.0	Report forthcoming (length damaged)
1d	Castleford	41.0	11.0	Report forthcoming (length damaged)
1d	Castleford	45.0	15.0	Report forthcoming (length damaged)
1d	Corbridge	51.0	14.0	75.1338
1d	Corbridge	33.0	12.0	75.1342 (length damaged)
1d	Hüfingen	73.5	15.0	ORL 62a, Taf.XI,54
1d	Hüfingen	64.5	15.0	<u>Ibid.</u> , Taf.XI,57
1d	Kingsholm	60.0	15.0	HURST, 1985, Fig.36,10 (length damaged)
1d	Oberstimm	58.5	16.0	SCHÖNBERGER, 1978, Taf.23,B178
1d	Petronell	41.0	9.0	STIGLITZ, 1986, Taf.6,14
1d	Rottweil	49.0	16.0	PLANCK, 1975, Taf.72,8 (length damaged)
1d	Silchester	50.0	12.0	BOON, 1969, Fig.5,19 (length damaged)
1d	Woodcock Hall	26.0	11.0	BROWN, 1986, No.196 (damaged)
1d	Wroxeter	67.5	14.0	WEBSTER, 1960, No.262
1e	The Lunt	44.0	13.0	HOBLEY, 1969, Fig.22,5 (length damaged)
1f	The Lunt	44.0	11.0	<u>Id.</u> , 1973, Fig.20,3 (damaged)
1g	Hod Hill	38.5	9.0	BRAILS福德, 1962, Fig.2,A31
1g	Hod Hill	34.5	8.0	<u>Ibid.</u> , Fig.2,A31
1g	The Lunt	43.0	12.0	HOBLEY, 1973, Fig.21,12
1h	Gellep	57.0	14.0	PAAR & RUGER, 1971, Bild 22,22
1h	London	49.5	15.0	WEBSTER, 1960, No.153
1i	Burghöfe	55.5	13.5	ULBERT, 1959, Taf.51,6
1i	Gellep	48.0	12.0	PAAR & RUGER, 1971, Bild 23,23
1i	Oberpeiching	55.0	12.0	MACKENSEN, 1987, Abb.63,6
1j	Hofheim	38.0	?	RITTERLING, 1904, Taf.III,11
1j	Neuß	47.5	12.5	LEHNER, 1904, Taf.XXXA,9
1j	Newstead	100.0	29.0	CURLE, 1911, Pl.LXXIV,6
1j	Newstead	98.0	28.0	<u>Ibid.</u> , Pl.LXXIV,6
1j	Newstead	95.5	28.0	<u>Ibid.</u> , Pl.LXXIV,6
1j	Newstead	98.0	30.0	<u>Ibid.</u> , Pl.LXXIV,6
1j	Rottweil	52.5	15.0	PLANCK, 1975, Taf.72,10
1k	Rheingönheim	58.5	12.0	ULBERT, 1969, Taf.35,8 (length damaged)
1k	Southwark	45.0	14.0	SHELDON, 1978, Fig.131,110 (length damaged)

**Table 7**

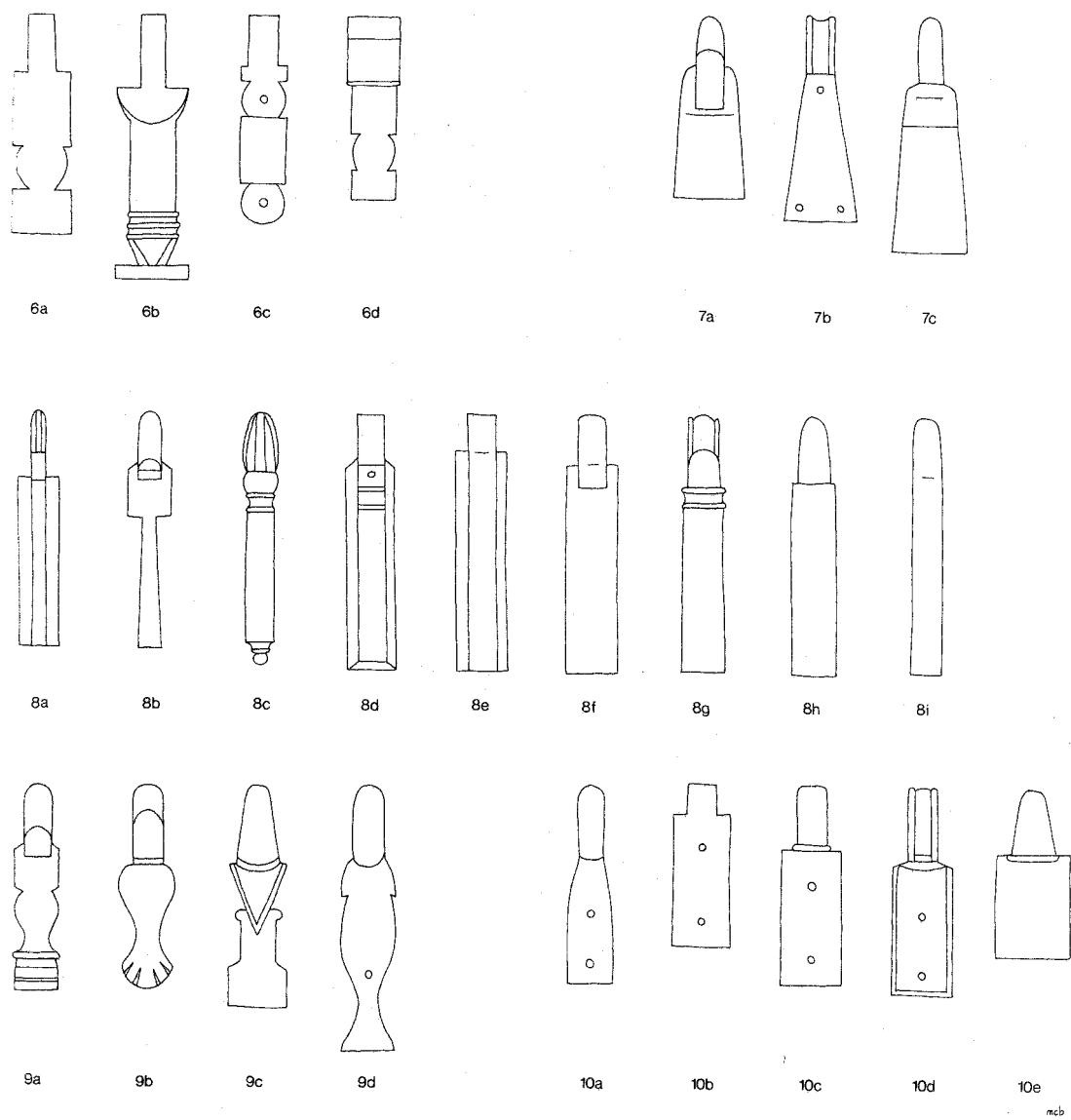


1l	Lincoln	55.0	16.5	WEBSTER, 1949, Pl.X,a
1l	Lincoln	57.0	16.5	<u>Ibid.</u> , Pl.X,a
1l	Lincoln	52.5	17.5	<u>Ibid.</u> , Pl.X,a
1l	Lincoln	55.5	17.0	<u>Ibid.</u> , Pl.X,a
1m	Colchester	37.0	12.5	CRUMMY, 1983, No.4200
1m	Colchester	34.0	11.0	<u>Ibid.</u> , No.4201
1m	Kempton	28.0	10.0	KRÄMER, 1957, Taf.B,23
1m	Kempton	28.0	11.0	<u>Ibid.</u> , Taf.B,23
1m	Kempton	29.0	11.0	<u>Ibid.</u> , Taf.B,23
1n	Heddernheim	58.0	11.0	FISCHER, 1973, Abb.16,2
1n	Heddernheim	61.0	10.5	<u>Ibid.</u> , Abb.16,2
1n	Moers-Asberg	62.0	13.0	BECHERT, 1974, Abb.71,2
1o	Longthorpe	75.5	17.0	FRERE & ST.JOSEPH, 1974, Fig.30,58
1o	Vindonissa	49.0	17.0	UNZ, 1973, Abb.9,94 (length damaged)
1p	Gallanach	56.0	15.0	RITCHIE, 1974, Fig.2,8 (length damaged)
1p	Oberstimm	56.0	13.5	SCHÖNBERGER, 1978, Taf.23,B182 (length damaged)
1q	Oberstimm	46.5	14.0	<u>Ibid.</u> , Taf.23,B186
2a	Hofheim	65.0	12.0	RITTERLING, 1913, Taf.XIII,1
2a	Hofheim	68.0	13.5	<u>Ibid.</u> , Taf.XIII,8
2a	Hofheim	70.5	13.5	<u>Ibid.</u> , Taf.XIII,8
2a	Hofheim	70.5	13.5	<u>Ibid.</u> , Taf.XIII,8
2a	Mainz	63.0	0.0	BEHRENS & BRENNER, 1911, Abb.26,45
2a	Nijmegen	61.0	12.0	BOGAERS & HAALEBOS, 1975, Fig.12
2a	Nijmegen	62.0	12.0	<u>Ibid.</u> , Fig.12
2a	Nijmegen	50.0	13.0	<u>Ibid.</u> , Fig.12 (length damaged)
2a	Nijmegen	62.0	12.0	<u>Ibid.</u> , Fig.12
2a	Riftissen	78.0	15.0	ULBERT, 1970, Taf.23,356
2a	Vindonissa	68.0	14.0	UNZ, 1973, Abb.10,103
2b	Sheepen	33.0	7.0	HAWKES & HULL, 1947, Pl.CIII,9
2b	Sheepen	33.0	7.0	<u>Ibid.</u> , Pl.CIII,9
2b	Sheepen	34.0	8.0	<u>Ibid.</u> , Pl.CIII,9
2c	Arlaines	149.0	17.0	BOUSQUET, 1977, pl.XLII,Ar.76-37 (unfinished?)
2c	Arlaines	145.0	20.0	<u>Ibid.</u> , pl.XLII,Ar.76-37 (unfinished?)
2c	Arlaines	153.0	18.5	<u>Ibid.</u> , pl.XLII,Ar.76-37 (unfinished?)
2c	Arlaines	137.0	22.0	<u>Ibid.</u> , pl.XLII,Ar.76-37 (unfinished?)
2c	Arlaines	149.0	18.0	<u>Ibid.</u> , pl.XLII,Ar.76-37 (unfinished?)
2c	Arlaines	149.0	21.0	<u>Ibid.</u> , pl.XLII,Ar.76-37 (unfinished?)
2c	Arlaines	138.0	19.0	<u>Ibid.</u> , pl.XLII,Ar.76-37 (unfinished?)
3a	Corbridge	51.5	19.0	75.1343 (length damaged)
3a	Corbridge	53.0	17.0	Allason-Jones in BISHOP & DORE, forthcoming, No.124 (length damaged)
3a	Hüfingen	48.0	16.5	REVILLIO, 1929, Abb.4,2
3a	The Lunt	55.0	20.0	HOBLEY, 1969, Fig.20,3 (length damaged)
3a	The Lunt	52.0	20.0	<u>Ibid.</u> , Fig.20,3 (damaged)
3a	The Lunt	48.0	20.0	<u>Ibid.</u> , Fig.20,3 (length damaged)
3a	The Lunt	45.0	20.0	<u>Ibid.</u> , Fig.20,3 (length damaged)
3a	Moers-Asberg	51.0	16.0	BECHERT, 1974, Abb.71,1 (damaged)
3a	Moers-Asberg	50.0	18.0	<u>Ibid.</u> , Abb.71,1 (length damaged)
3a	Moers-Asberg	52.0	16.0	<u>Ibid.</u> , Abb.71,1 (damaged)
3a	Moers-Asberg	54.0	17.5	<u>Ibid.</u> , Abb.71,1 (length damaged)
3a	Neuß	45.0	16.0	LEHNER, 1904, Taf.XXX,A6
3a	Woodcock Hall	46.5	15.0	BROWN, 1986, No.195 (length damaged)
3a	Wroxeter	45.0	18.0	WEBSTER, 1960, No.247 (damaged)
3b	Gloucester	49.5	15.0	<u>Ibid.</u> , No.101
3c	Newstead	75.0	26.0	CURLE, 1911, Pl.LXXII,1
3c	Newstead	76.5	24.0	<u>Ibid.</u> , Pl.LXXII,2
3c	Newstead	74.0	20.0	<u>Ibid.</u> , Pl.LXXII,5
3c	Newstead	78.0	19.0	<u>Ibid.</u> , Pl.LXXII,6
3c	Newstead	73.5	18.0	<u>Ibid.</u> , Pl.LXXII,7
3c	Newstead	67.5	19.0	<u>Ibid.</u> , Pl.LXXII,11 (length damaged)

Table 7

3d	Hüfingen	46.5	16.5	REVILLIO, 1929, Abb.4,1
3d	Hüfingen	51.0	18.0	<u>Ibid.</u> , Abb.4,1
3d	Hüfingen	43.5	16.5	<u>Ibid.</u> , Abb.4,1 (length damaged)
3d	Hüfingen	51.0	16.5	<u>Ibid.</u> , Abb.4,2
3d	Hüfingen	52.5	18.0	<u>Ibid.</u> , Abb.4,2
3d	Hüfingen	54.0	18.0	<u>Ibid.</u> , Abb.4,2
3d	Hüfingen	55.5	18.0	<u>Ibid.</u> , Abb.4,2
3e	Seven Sisters	40.5	15.0	DAVIES & SPRATLING, 1976, Fig.3,4 (damaged)
3f	Hofheim	32.0	12.0	RITTERLING, 1904, Taf.III,14
3g	Castleford	35.0	11.0	Report forthcoming (length damaged)
3g	Kingsholm	58.0	18.0	HURST, 1985, Fig.11,7 (length damaged)
4a	Baden	39.0	10.0	UNZ, 1971, Abb.5,34 (length damaged)
4a	The Lunt	75.0	15.0	HOBLEY, 1969, Fig.21,12
4b	Riðtissen	39.0	10.5	ULBERT, 1959, Taf.62,13
4c	Hod Hill	65.0	12.0	BRAILSFORD, 1962, Fig.2,A30
4c	Hod Hill	61.0	12.0	<u>Ibid.</u> , Fig.2,A30 (length damaged)
4c	Hod Hill	64.0	12.0	<u>Ibid.</u> , Fig.2,A30 (length damaged)
4c	Hod Hill	69.0	13.0	<u>Ibid.</u> , Fig.2,A32 (length damaged)
4c	Kempton	64.0	13.0	KRÄMER, 1957, Taf.B,10 (length damaged)
4d	Hofheim	79.5	10.5	RITTERLING, 1913, Taf.XIII,30
4a	Strasbourg	61.5	13.5	FORRER, 1927, Taf.LXXVII,1
4e	Strasbourg	58.5	15.0	<u>Ibid.</u> , Taf.LXXVII,1
4e	Strasbourg	63.0	15.0	<u>Ibid.</u> , Taf.LXXVII,1
4e	Strasbourg	63.0	13.5	<u>Ibid.</u> , Taf.LXXVII,1
4f	Seven Sisters	72.0	13.0	DAVIES & SPRATLING, 1976, Fig.3,1
4f	Verulamium	42.0	12.0	FRERE, 1984, Fig.12,86
4g	Wiesbaden	37.0	10.0	ORL Nr.31, Taf.X,51
5a	Brecon	80.0	17.0	WHEELER, 1926, Fig.57,1
5a	Chichester	77.0	19.0	DOWN & RULE, 1971, Fig.3.15,2 (damaged)
5a	Hofheim	84.0	16.5	RITTERLING, 1913, Taf.XIII,24 (length damaged)
5a	Hofheim	66.0	16.5	<u>Ibid.</u> , Taf.XIII,34
5a	Hofheim	67.0	16.0	<u>Ibid.</u> , Taf.XIII,34
5a	Hofheim	66.0	17.0	<u>Ibid.</u> , Taf.XIII,34
5a	Kempton	73.5	16.0	KRÄMER, 1957, Taf.16,23
5a	Kempton	73.5	16.0	<u>Ibid.</u> , Taf.16,23
5a	Kempton	75.0	16.0	<u>Ibid.</u> , Taf.16,23
5a	Kempton	74.0	16.0	<u>Ibid.</u> , Taf.16,23
5a	Lincoln	75.0	17.0	Unpublished
5a	Rheingönheim	66.0	16.5	ULBERT, 1969, Taf.35,5 (length damaged)
5a	Sheepen	70.0	16.0	HAWKES & HULL, 1947, Pl.CIII,7
5a	Vindonissa	84.0	22.0	SITTERDING, 1962, Abb.18,10
5a	Vindonissa	52.0	22.0	<u>Ibid.</u> , Abb.18,10 (length damaged)
5a	Vindonissa	71.0	14.0	UNZ, 1973, Abb.10,101
5b	Colchester	47.5	16.5	CRUMMY, 1983, No.4199 (damaged)
5b	Kempton	80.0	14.0	KRÄMER, 1957, Taf.B,7
5b	Mainz	52.0	?	BEHRENS & BRENNER, 1911, Abb.26,46
5b	Mainz	90.0	?	BEHRENS, 1912, Abb.3,5
5b	Mainz	55.0	?	<u>Id.</u> , 1918, Abb.8,8
5b	Rheingönheim	85.5	17.0	ULBERT, 1969, Taf.35,6
5b	Sheepen	69.5	14.0	NIBLETT, 1985, Fig.72,103 (width damaged?)
5b	Vindonissa	44.0	17.0	UNZ, 1973, Abb.9,92 (damaged)
5c	Aislingen	57.0	13.5	ULBERT, 1959, Taf.18,13 (length damaged?)
5d	Riðtissen	57.0	21.0	<u>Ibid.</u> , Taf.62,24 (length damaged)
5e	Newstead	73.5	19.0	CURLE, 1911, Pl.LXXII,12
5e	Newstead	73.5	19.5	<u>Ibid.</u> , Pl.LXXII,13
5e	Newstead	66.0	19.5	<u>Ibid.</u> , Pl.LXXII,150

**Table 7**



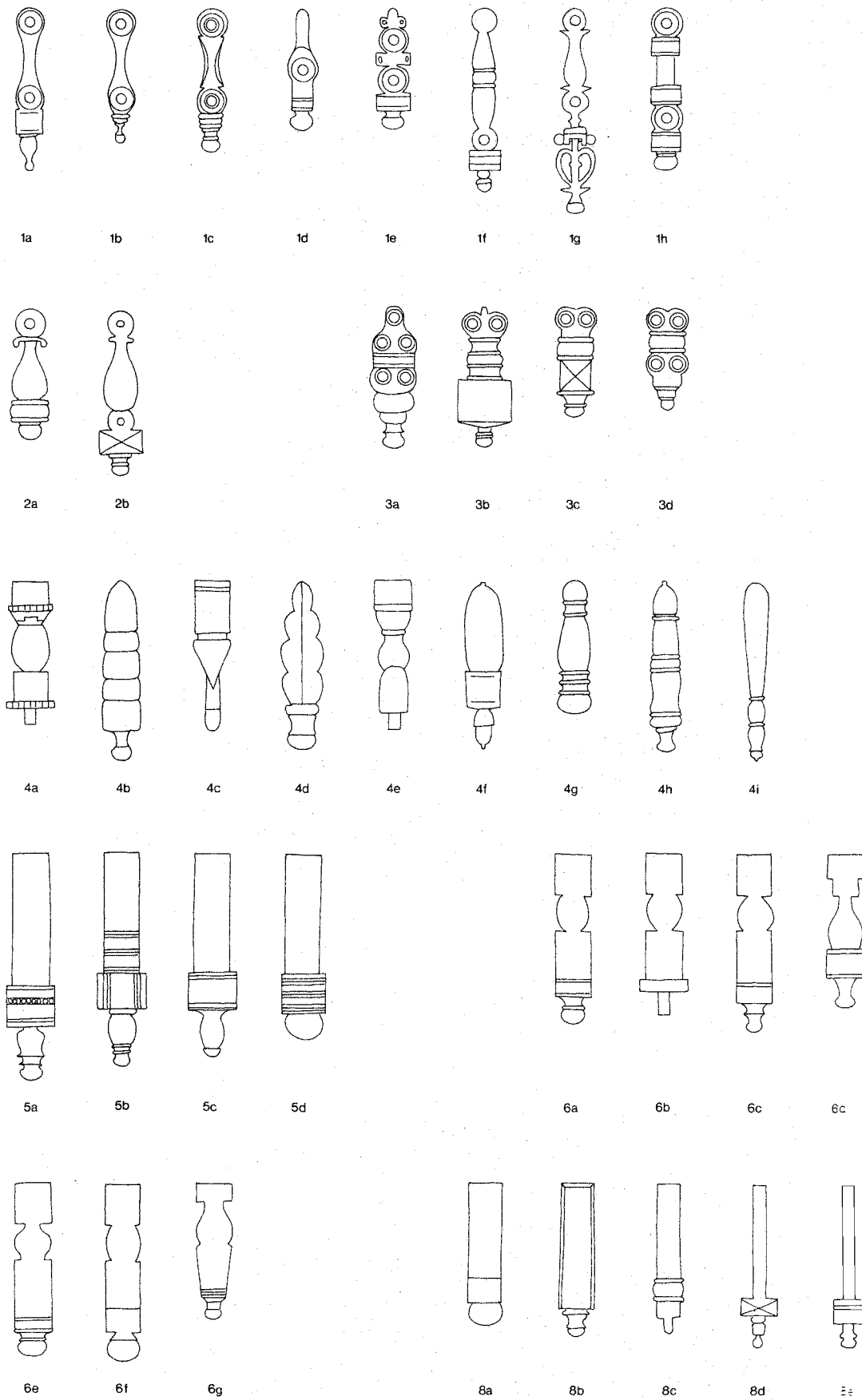
**Fig.51:** Type sketches for junction loops, Types 6-10.

5e	Newstead	70.5	21.0	<u>Ibid.</u> , Pl.LXXII,16
5f	Hofheim	46.5	10.5	RITTERLING, 1913, Taf.XII,17
5g	Augsburg- Oberhausen	64.0	11.0	HÜBENER, 1973, Taf.13,5
5g	Lorenzberg	84.0	16.5	ULBERT, 1965, Taf.2,11 (length damaged)
5g	Neuß	80.0	17.0	LEHNER, 1904, Taf.XXXA,16
5g	Strasbourg	78.0	15.0	FORRER, 1927, Taf.LXXVII,18
5h	Mainz	60.0	?	BEHRENS, 1912, Abb.3,6
5i	Augsburg- Oberhausen	46.0	16.0	HÜBENER, 1973, Taf.13,1 (damaged)
5i	Augsburg- Oberhausen	60.0	13.0	<u>Ibid.</u> , Taf.13,1 (damaged)
5i	Augsburg- Oberhausen	44.0	15.0	<u>Ibid.</u> , Taf.13,1 (damaged)
5i	Augsburg- Oberhausen	50.0	13.0	<u>Ibid.</u> , Taf.13,1 (damaged)
5i	Valkenburg	73.0	17.0	GLASBERGEN & GROENMAN-VAN WAATERINGE,1974, Pl.14,48
5i	Valkenburg	73.0	18.0	<u>Ibid.</u> , Pl.14,48
5i	Valkenburg	70.0	18.0	<u>Ibid.</u> , Pl.14,48
5i	Valkenburg	75.0	17.0	<u>Ibid.</u> , Pl.14,48
6a	Aislingen	54.0	9.0	ULBERT, 1959, Taf.18,4
6a	Aislingen	57.0	8.0	<u>Ibid.</u> , Taf.18,6
6a	Colchester	47.0	9.0	CRUMMY, 1983, No.4214 (length damaged)
6a	Doorwerth	77.0	18.0	BROUWER, 1982, Nr.138
6a	Doorwerth	79.0	19.0	<u>Ibid.</u> , Nr.138
6a	Doorwerth	85.0	18.0	<u>Ibid.</u> , Nr.139
6a	Doorwerth	82.0	17.0	<u>Ibid.</u> , Nr.139
6a	Doorwerth	77.0	18.0	<u>Ibid.</u> , Nr.140
6a	Doorwerth	81.0	18.0	<u>Ibid.</u> , Nr.140
6a	Doorwerth	79.0	18.0	<u>Ibid.</u> , Nr.141
6a	Doorwerth	81.0	18.0	<u>Ibid.</u> , Nr.141
6a	Doorwerth	86.0	19.0	<u>Ibid.</u> , Nr.142
6a	Doorwerth	82.0	18.0	<u>Ibid.</u> , Nr.142
6a	Doorwerth	79.0	19.0	<u>Ibid.</u> , Nr.143
6a	Doorwerth	79.0	19.0	<u>Ibid.</u> , Nr.143
6a	Doorwerth	83.0	18.0	<u>Ibid.</u> , Nr.144
6a	Doorwerth	83.0	17.0	<u>Ibid.</u> , Nr.144
6a	Doorwerth	78.0	19.0	<u>Ibid.</u> , Nr.145
6a	Doorwerth	79.0	18.0	<u>Ibid.</u> , Nr.145
6a	Doorwerth	79.0	19.0	<u>Ibid.</u> , Nr.145
6a	Doorwerth	83.0	16.0	<u>Ibid.</u> , Nr.146
6a	Doorwerth	85.0	19.0	<u>Ibid.</u> , Nr.146
6a	Doorwerth	85.0	18.0	<u>Ibid.</u> , Nr.146
6a	Doorwerth	64.0	13.0	<u>Ibid.</u> , Nr.183
6a	Doorwerth	62.0	13.0	<u>Ibid.</u> , Nr.183
6a	Doorwerth	51.0	13.0	<u>Ibid.</u> , Nr.187
6a	Doorwerth	52.0	12.0	<u>Ibid.</u> , Nr.187
6a	Doorwerth	56.0	12.0	<u>Ibid.</u> , Nr.188
6a	Doorwerth	59.0	13.0	<u>Ibid.</u> , Nr.188
6a	Doorwerth	60.0	13.0	<u>Ibid.</u> , Nr.188
6a	Doorwerth	53.0	12.0	<u>Ibid.</u> , Nr.189
6a	Doorwerth	51.0	11.0	<u>Ibid.</u> , Nr.189
6a	Doorwerth	50.0	12.0	<u>Ibid.</u> , Nr.189
6a	Doorwerth	54.0	12.0	<u>Ibid.</u> , Nr.190
6a	Doorwerth	52.0	12.0	<u>Ibid.</u> , Nr.190
6a	Doorwerth	52.0	12.0	<u>Ibid.</u> , Nr.190
6a	Doorwerth	52.0	12.0	<u>Ibid.</u> , Nr.190
6a	Silchester	52.0	?	BOON, 1969, Fig.5,2
6a	Xanten	58.5	12.0	JENKINS, 1985, No.E60 (length damaged)
6a	Xanten	60.5	13.0	<u>Ibid.</u> , No.E61 (length damaged)
6a	Xanten	39.0	-	<u>Ibid.</u> , No.E62 (damaged)
6a	Xanten	58.5	11.5	<u>Ibid.</u> , No.E63 (length damaged)
6a	Xanten	57.0	12.5	<u>Ibid.</u> , No.E64 (length damaged)

**Table 7**

6a	Xanten	43.0	0.0	<u>Ibid.</u> , No.E65 (damaged)
6a	Xanten	35.5	0.0	<u>Ibid.</u> , No.E66 (damaged)
6a	Xanten	32.5	0.0	<u>Ibid.</u> , No.E67 (damaged)
6a	Xanten	17.5	0.0	<u>Ibid.</u> , No.E68 (length damaged)
6a	Xanten	28.0	0.0	<u>Ibid.</u> , No.E69 (damaged)
6a	Xanten	31.0	12.0	<u>Ibid.</u> , No.E70 (length damaged)
6b	Doorwerth	92.0	23.0	BROUWER, 1982, Nr.144
6c	Aislingen	55.5	10.5	ULBERT, 1959, Taf.18,5
6d	RiBtissen	40.5	10.5	<u>Ibid.</u> , Taf.62,17
7a	London	43.5	14.0	WEBSTER, 1960, No.152
7b	Rheingonheim	58.5	23.0	ULBERT, 1969, Taf.35,3
7c	Valkenburg	47.0	15.0	GLASBERGEN & GROENMAN-VAN WAATERINGE, 1974, Pl.15,3
7c	Valkenburg	48.0	16.0	<u>Ibid.</u> , Pl.15,3
8a	Aislingen	76.5	10.5	ULBERT, 1959, Taf.18,22
8a	Mainz	76.0	?	BEHRENS & BRENNER, 1911, Abb.26,47
8b	Aislingen	73.5	13.0	ULBERT, 1959, Taf.18,23
8b	Hofheim	60.0	14.0	RITTERLING, 1913, Taf.XIII,33
8b	Hofheim	70.5	10.5	<u>Ibid.</u> , Taf.XIII,35
8b	RiBtissen	66.0	13.5	ULBERT, 1970, Taf.23,357
8c	Ham Hill	76.5	15.0	WEBSTER, 1960, No.117 (length damaged)
8d	Hofheim	74.0	12.0	RITTERLING, 1904, Taf.111,1
8d	Hofheim	75.0	10.5	<u>Id.</u> , 1913, Taf.XII,16
8d	Longthorpe	72.0	10.5	FRERE & ST.JOSEPH, 1974, Fig.30,59
8d	Oberstimm	76.5	15.0	SCHÖNBERGER, 1978, Taf.23,B183
8e	Kempton	79.0	13.0	KRÄMER, 1957, Taf.B,8
8f	Kempton	86.0	13.0	<u>Ibid.</u> , Taf.B,9
8g	South Cadbury	69.0	10.5	WILSON, 1970, Pl.XXXV,A
8h	Oberstimm	84.0	15.0	SCHÖNBERGER, 1978, Taf.23,B184
8i	Sheepen	93.0	11.0	NIBLETT, 1985, Fig.72,102
9a	Rheingonheim	55.5	19.5	ULBERT, 1969, Taf.35,4
9b	RiBtissen	52.5	15.0	<u>Id.</u> , Taf.62,18
9c	Hofheim	53.0	16.0	RITTERLING, 1904, Taf.III,12
9d	Colchester	70.0	14.5	DUNNETT, 1971, Fig.11,21
9d	Vindonissa	71.0	15.0	UNZ, 1973, Abb.10,99
10a	Aislingen	64.5	16.0	ULBERT, 1959, Taf.18,23
10a	Nijmegen	43.0	10.0	BOGAERS & HAALEBOS, 1975, Fig.11,2
10b	Hofheim	46.5	22.0	RITTERLING, 1913, Taf.XIII,40
10b	Hofheim	49.5	22.5	<u>Ibid.</u> , Taf.XIII,41
10c	Strasbourg	31.5	10.0	FORRER, 1927, Fig.435
10c	Vindonissa	38.0	10.0	UNZ, 1973, Abb.10,109
10d	Dangstetten	58.5	26.0	FINGERLIN, 1971, Abb.11,11
10e	Augsburg- Oberhausen	48.0	23.0	HÜBENER, 1973, Taf.13,2
10e	Augsburg- Oberhausen	52.0	23.0	<u>Ibid.</u> , Taf.13,2

**Table 7**



**Fig.52:** Type sketches for strap terminals, Types 1-83.

## STRAP TERMINALS

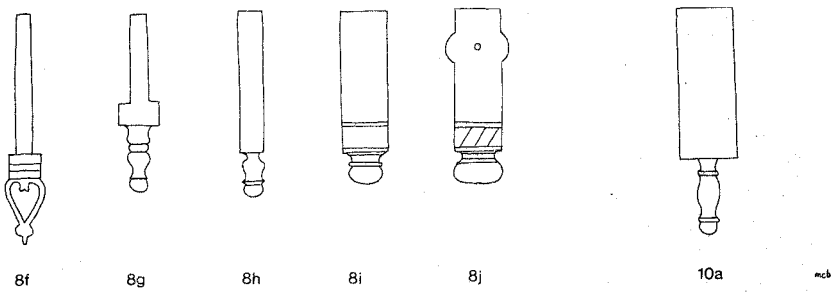
Type	Site	Length (mm)	Width (mm)	Reference
1a	Hüfingen	60.0	15.0	REVILLIO, 1929, Abb.3,5
1a	Hüfingen	55.5	12.0	<u>Ibid.</u> , Abb.3,8
1a	Riðtissen	47.0	12.0	ULBERT, 1970, Taf.1,13 (length damaged)
1a?	Chelmsford	47.0	18.0	WICKENDEN, this vol., Fig.3,3 (length damaged)
1b	Newstead	46.0	12.5	CURLE, 1911, Pl.LXXVI.13 (length damaged)
1b	Corbridge	35.0	14.0	Allason-Jones in BISHOP & DORE, forthcoming. No.116 (length damaged)
1b	Straubing	56.0	14.0	WALKE, 1965, Taf.99,10
1c	Corbridge	41.0	14.0	Allason-Jones in BISHOP & DORE, forthcoming. No.117 (length damaged)
1c	Gellep	49.0	14.5	PAAR & RUGER, 1971, Bild 22,20
1c	Gellep	34.0	14.5	<u>Ibid.</u> , Bild 23,21 (length damaged)
1d	Longthorpe	59.5	14.0	FRERE & ST.JOSEPH, 1974, Fig.27,44
1d	South Cadbury	57.5	15.0	WILSON, 1970, Pl.XXXV,A
1e	Longthorpe	58.0	22.0	FRERE & ST.JOSEPH, 1974, Fig.30,57 (length damaged)
1f	Augsburg- Oberhausen	88.0	14.0	HÜBENER, 1973, Taf.9,20
1g	Augsburg- Oberhausen	72.0	13.0	<u>Ibid.</u> , Taf.13,35
1h	Cirencester	66.0	12.0	WEBSTER, 1960, Fig.3,26
2a	The Lunt	47.5	12.0	HOBLEY, 1973, Fig.22,24 (length damaged)
2b	Hofheim	67.5	13.5	RITTERLING, 1913, Taf.XIII,2
2b	Hofheim	64.0	10.5	<u>Ibid.</u> , Taf.XIII,12
2b	Riðtissen	55.0	12.0	ULBERT, 1959, Taf.62,9
3a	Heddernheim	58.5	14.5	FISCHER, 1973, Abb.15,5
3a	Hüfingen	52.5	15.0	REVILLIO, 1929, Abb.3,13
3a	Newstead	53.0	13.5	CURLE, 1911, Pl.LXXVI,6
3b	Hofheim	42.0	13.5	RITTERLING, 1913, Taf.XV,74
3c	Hüfingen	41.0	16.5	REVILLIO, 1929, Abb.3,12
3d	Hüfingen	48.0	16.5	<u>Ibid.</u> , Abb.3,14
4a	Hod Hill	46.5	17.0	BRAILSFORD, 1962, Fig.3,A37 (length damaged)
4b	Hod Hill	50.0	10.5	RICHMOND, 1968, Fig.56,15
4c	Sheepen	49.0	13.0	HAWKES & HULL, 1947, Pl.CII,26
4d	Newstead	49.5	13.0	CURLE, 1911, Pl.LXXVI,9
4e	Fremington Hagg	61.0	19.0	WEBSTER, 1971, Fig.14,71
4f	Strasbourg	54.0	10.5	FORRER, 1927, Taf.LXXVII,4
4g	Chichester	44.0	10.0	DOWN, 1978, Fig.10.34,63
4h	Longthorpe	48.0	9.0	FRERE & ST.JOSEPH, 1974, Fig.28,49
4i	Augsburg- Oberhausen	40.0	9.0	HÜBENER, 1973, Taf.9,22
4i	Oberstimm	58.0	8.0	SCHÖNBERGER, 1978, Taf.22,B153
5a	Haltern	85.0	18.0	MAKW 3, Taf.XV,4
5a	Newstead	84.0	18.0	CURLE, 1911, Pl.LXXII,8
5a	Newstead	88.5	18.0	<u>Ibid.</u> , Pl.LXXII.10
5a	Rheingönheim	73.5	18.0	ULBERT, 1969, Taf.35,7 (length damaged)
5b	Aislingen	52.5	14.0	<u>Id.</u> , 1959, Taf.18,11
5c	Colchester	77.0	18.0	WEBSTER, 1960, Fig.5,115
5d	Colchester	49.5	12.0	<u>Ibid.</u> , Fig.5,116

**Table 8**

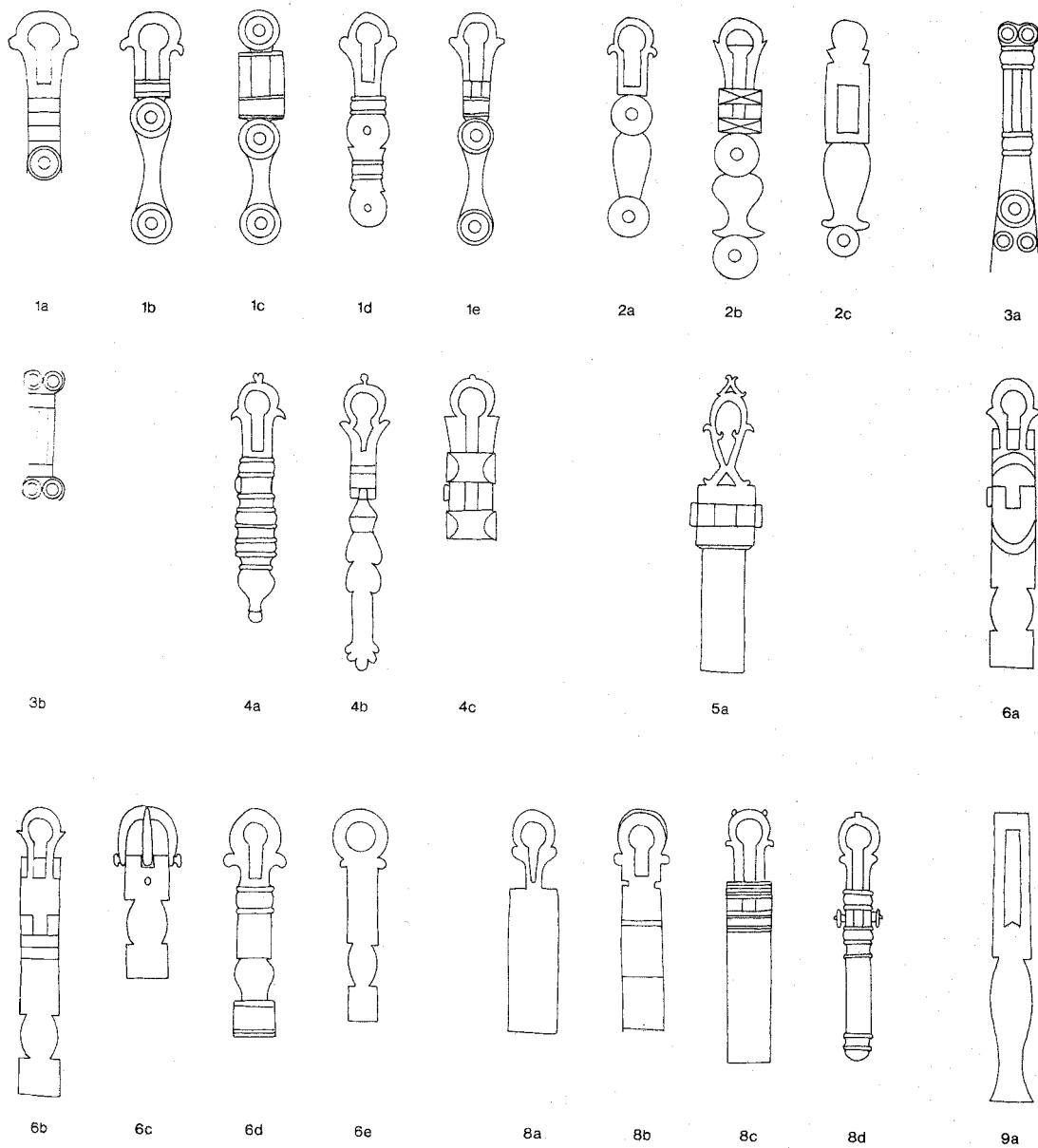
6a	Colchester	35.0	10.5	Ibid., Fig.4,72 (length damaged)
6b	Doorwerth	71.0	16.0	BROUWER, 1982, Nr.133
6b	Doorwerth	63.0	17.0	Ibid., Nr.134
6b	Doorwerth	73.0	18.0	Ibid., Nr.135
6b	Doorwerth	69.0	16.0	Ibid., Nr.136
6c	Aislingen	46.0	9.0	ULBERT, 1959, Taf.18,10
6c	Chester	58.0	10.5	Unpublished (384.R.1976)
6c	Ham Hill	53.0	12.0	GRAY, 1926, Pl.XIV,E21
6c	Longthorpe	59.0	13.0	FRERE & ST.JOSEPH, 1974, Fig.28,45
6c	Mildenhall	40.0	11.0	GRIFFITHS, 1983, No.9
6c	Neuß	50.0	13.0	LEHNER, 1904, Taf.XXXA,12
6c	Oberstimm	50.0	12.0	SCHÖNBERGER, 1978, Taf.22,B154
6c	Riðtissen	43.0	8.0	ULBERT, 1970, Taf.23,353 (length damaged)
6c	Sheepen	52.0	12.0	HAWKES & HULL, 1947, Pl.CII,24
6c	Sheepen	51.0	12.0	Ibid., Pl.CII,25
6c	Sheepen	55.5	14.0	NIBLETT, 1985, Fig.72,105
6c	Thamusida	45.0	7.0	BOUBE-PICCOT, 1964, No.45
6c	Volubilis	36.0	9.0	Ibid., No.46
6d	Sheepen	48.0	16.0	HAWKES & HULL, 1947, Pl.CII,27
6e	Hufingen	51.0	13.5	ORL Nr.62a, Taf.XI,6
6e	Verulamium	49.5	14.0	FRERE, 1984, Fig.11,80
6f	Moers-Asberg	36.0	9.0	BECHERT, 1974, Abb.67,10
6f	Newstead	44.0	9.5	CURLE, 1911, Pl.LXXVI,4
6f	Newstead	62.5	14.5	Ibid., Pl.LXXVI,7
6f	Newstead	54.0	9.5	Ibid., Pl.LXXVI,8
6f?	Corbridge	52.0	10.0	Allason-Jones in BISHOP & DORE, forthcoming, No.114
6g	Wiesbaden	48.0	18.0	ORL Nr.31, Taf.X,50
8a	Burghöfe	49.5	8.0	ULBERT, 1959, Taf.51,5
8a	Newstead	48.5	9.0	CURLE, 1911, Pl.LXXVI,5
8a	Newstead	44.0	7.0	Ibid., Pl.LXXVI,16
8a	Riðtissen	47.0	8.0	ULBERT, 1970, Taf.23,354
8b	Hod Hill	53.0	10.0	BRAILSFORD, 1962, Fig.3,A46
8b	Oberstimm	51.0	8.0	SCHÖNBERGER, 1978, Taf.22,B155 (length damaged)
8c	Rheingönheim	45.0	10.0	ULBERT, 1969, Taf.28,17
8d	Burghöfe	44.0	9.0	Id., 1959, Taf.51,4
8d	Rheingönheim	58.5	10.5	Id., 1969, Taf.28,18
8e	Augsburg-Oberhausen	61.0	13.0	HÜBENER, 1973, Taf.9,12 (length damaged)
8e	Augsburg-Oberhausen	66.0	15.0	Ibid., Taf.9,15
8e	Augsburg-Oberhausen	31.0	16.0	Ibid., 1973, Taf.9,42
8e	Hofheim	56.0	13.0	RITTERLING, 1904, Taf.III,15
8e	Longthorpe	51.0	9.0	FRERE & ST.JOSEPH, 1974, Fig.28,48
8e	Oberstimm	60.0	12.0	SCHÖNBERGER, 1978, Taf.22,B156
8f	Augsburg-Oberhausen	84.0	17.0	HÜBENER, 1973, Taf.9,19
8g	Augsburg-Oberhausen	58.0	14.0	Ibid., Taf.9,44
8h	Augsburg-Oberhausen	60.0	8.0	Ibid., 1973, Taf.9,21
8i	Chester	48.0	12.0	Unpublished (length damaged)
8i	Chichester	30.0	8.5	DOWN, 1978, Fig.10.34,59 (length damaged)
8i	Colchester	43.5	10.5	WEBSTER, 1960, Fig.4,73
8i	Hofheim	57.0	16.5	RITTERLING, 1913, Taf.XII,18
8j	Richborough	50.0	12.0	BUSHE-FOX, 1932, Pl.XIV,48
10a	Riðtissen	66.0	21.0	ULBERT, 1970, Taf.23,355

**Table 8**





**Fig.53:** Type sketches for strap terminals, Types 8f-10.



**Fig.54:** Type sketches for strap fasteners (female).

## STRAP FASTENERS (FEMALE)

Type	Site	Length (mm)	Width (mm)	Reference
1a	Ham Hill	58.5	18.5	GRAY, 1923, Pl.XI,13 (length damaged)
1b	Hofheim	61.5	13.5	RITTERLING, 1913, Taf.XIII,19 (length damaged)
1c	Baden	76.0	15.0	UNZ, 1971, Abb.5,42
1c	Corbridge	43.0	14.0	ALLASON-JONES & BISHOP, forthcoming, No.235 (length damaged)
1d	Oberstimm	65.0	18.0	SCHÖNBERGER, 1978, Taf.23,B175
1e	Verulamium	45.0	16.0	FRERE, 1984, Fig.11,78 (length damaged)
2a	Hofheim	42.0	12.0	RITTERLING, 1913, Taf.XIII,18 (length damaged)
2a	Rheinhessen	48.0	14.5	AuhV 2, Heft X Taf.4,8 (length damaged)
2b	Vindonissa	74.0	19.0	UNZ, 1973, Abb.9,96
2c	Oberstimm	65.0	16.0	SCHÖNBERGER, 1978, Taf.23,B177
3a	Oberstimm	83.0	20.0	<u>Ibid.</u> , Taf.23,B176
3b	Chester	33.0	15.0	Unpublished (length damaged)
4a	Rheingönheim	88.0	20.0	ULBERT, 1969, 35,9
4b	Longthorpe	82.5	14.5	FRERE & ST. JOSEPH, 1974, Fig. 27, 38
4c	Waddon Hill	49.5	15.0	WEBSTER, 1960, Fig.7,210
5a	Hofheim	101.0	21.0	RITTERLING, 1913, Taf.XII,18
6a	Doorwerth	79.0	15.0	BROUWER, 1982, Nr.276
6a	Thamusida	72.0	17.0	BOUBE-PICCOT, 1964, No.47
6b	Doorwerth	56.0	13.0	BROUWER, 1982, Nr.280 (length damaged)
6b	Hod Hill	65.0	18.5	BRAILSFORD, 1962, Fig.2,A35 (length damaged)
6b	Hofheim	68.0	9.5	RITTERLING, 1904, Taf.III,21 (length damaged)
6b	Riñtissen	60.0	11.0	ULBERT, 1959, Taf.62,20 (length damaged)
6b	Riñtissen	68.0	17.0	<u>Id.</u> , 1970, Taf.1,12 (length damaged)
6b	Xanten	65.5	13.5	JENKINS, 1985, F71
6b	Xanten	65.0	0.0	<u>Ibid.</u> , F72 (damaged)
6c	Doorwerth	70.0	28.0	BROUWER, 1982, Nr.271/285
6d	Aislingen	54.0	14.0	ULBERT, 1959, Taf.18,12 (length damaged).
6d	Greensforge	74.0	16.0	WEBSTER, 1981, Fig.33
6d	Hofheim	60.0	17.0	RITTERLING, 1913, Taf.XI,45 (length damaged)
6d	Xanten	72.0	12.5	JENKINS, 1985, F73
6e	Rheingönheim	52.5	12.0	ULBERT, 1969, Taf.28,22
8a	Bregenz	54.0	18.0	MACKENSEN, 1987, Abb.64,6
8a	Newstead	54.0	15.0	CURLE, 1911, Pl.LXXVI,14
8b	Alise-Sainte-Reine	76.0	18.0	RABEISEN & MENU, 1985, Fig.5,41
8b	Riñtissen	76.5	13.5	ULBERT, 1959, Taf.62,22
8c	Vindonissa	89.0	21.0	UNZ, 1973, Abb.9.95
8d	Nettleton Shrub	71.0	18.0	SWANN, 1970, Fig.1
9a	Harlow	80.5	13.5	FRANCE & GOBEL, 1985, Fig.46,120

**Table 9**

## STRAP FASTENERS (MALE)

	Site	Length (mm)	Width (mm)	Reference
1a	Friedberg- Rederzhausen	54.0	15.0	VON SCHNURBEIN, 1983, Abb.8,7 (length damaged)
1b	Verulamium	49.5	13.0	WEBSTER, 1960, Fig.7,208
3a	Brecon	68.0	15.5	WHEELER, 1926, Fig.58,15
3a	Hüfingen	55.5	16.5	REVILLIO, 1929, Abb.3,1
3b	Hüfingen	50.0	15.0	<u>Ibid.</u> , Abb.3,4
4a	Kempten	50.0	16.0	KRÄMER, 1957, Taf.B,6
4b	Chichester	59.0	13.5	DOWN & RULE, 1971, Fig.3.18,3
4c	Augsburg- Oberhausen	54.0	12.0	HÜBENER, 1973, Taf.12,20
5a	Sheepen	67.0	18.0	HAWKES & HULL, 1947, Pl.CIII,2
5b	Hofheim	75.0	16.0	RITTERLING, 1913, Taf.XII,14
5b	Kempten	73.5	16.0	KRÄMER, 1957, Taf.16,22
5b	Vindonissa	85.0	16.0	UNZ, 1973, Abb.9,91
5c	Augsburg- Oberhausen	64.0	18.0	HÜBENER, 1973, Taf.12,26
6a	Doorwerth	69.0	21.0	BROUWER, 1982, Nr.278
6b	Doorwerth	92.0	23.0	<u>Ibid.</u> , Nr.144
6c	Rheingönheim	49.0	16.0	ULBERT, 1969, Taf.28,19 (length damaged)
8a	Hofheim	75.0	13.5	RITTERLING, 1913, Taf.XII,20
3b	Augsburg- Oberhausen	58.0	14.0	HÜBENER, 1973, Taf.12,27
8c	Hofheim	94.0	?	RITTERLING, 1904, Taf.III,13

Table 10

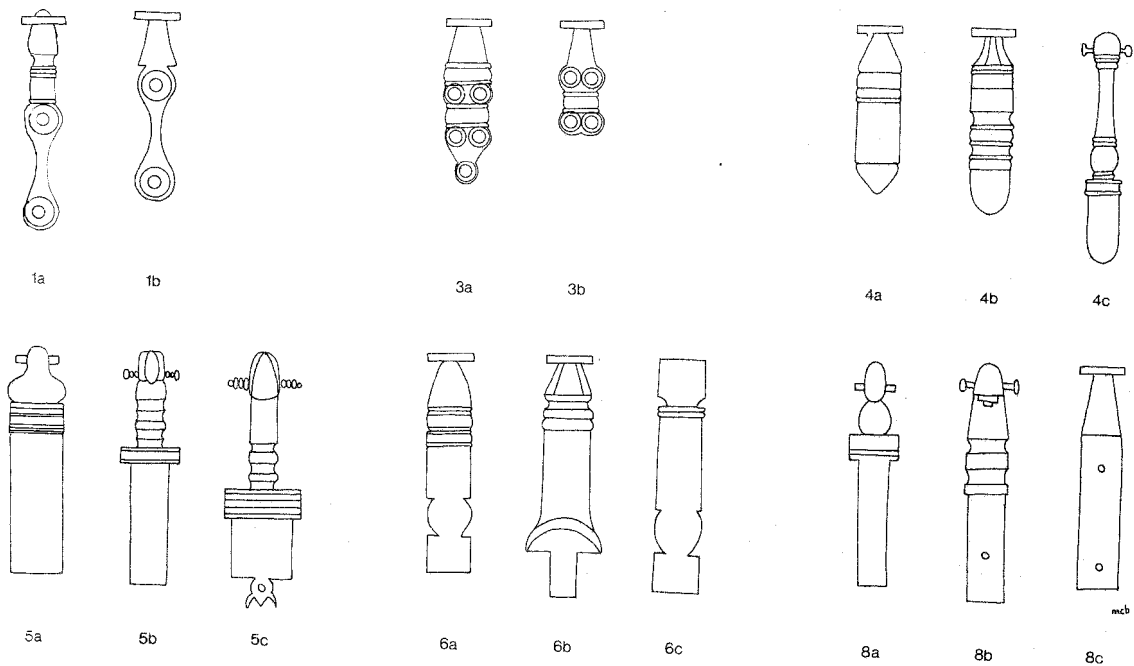
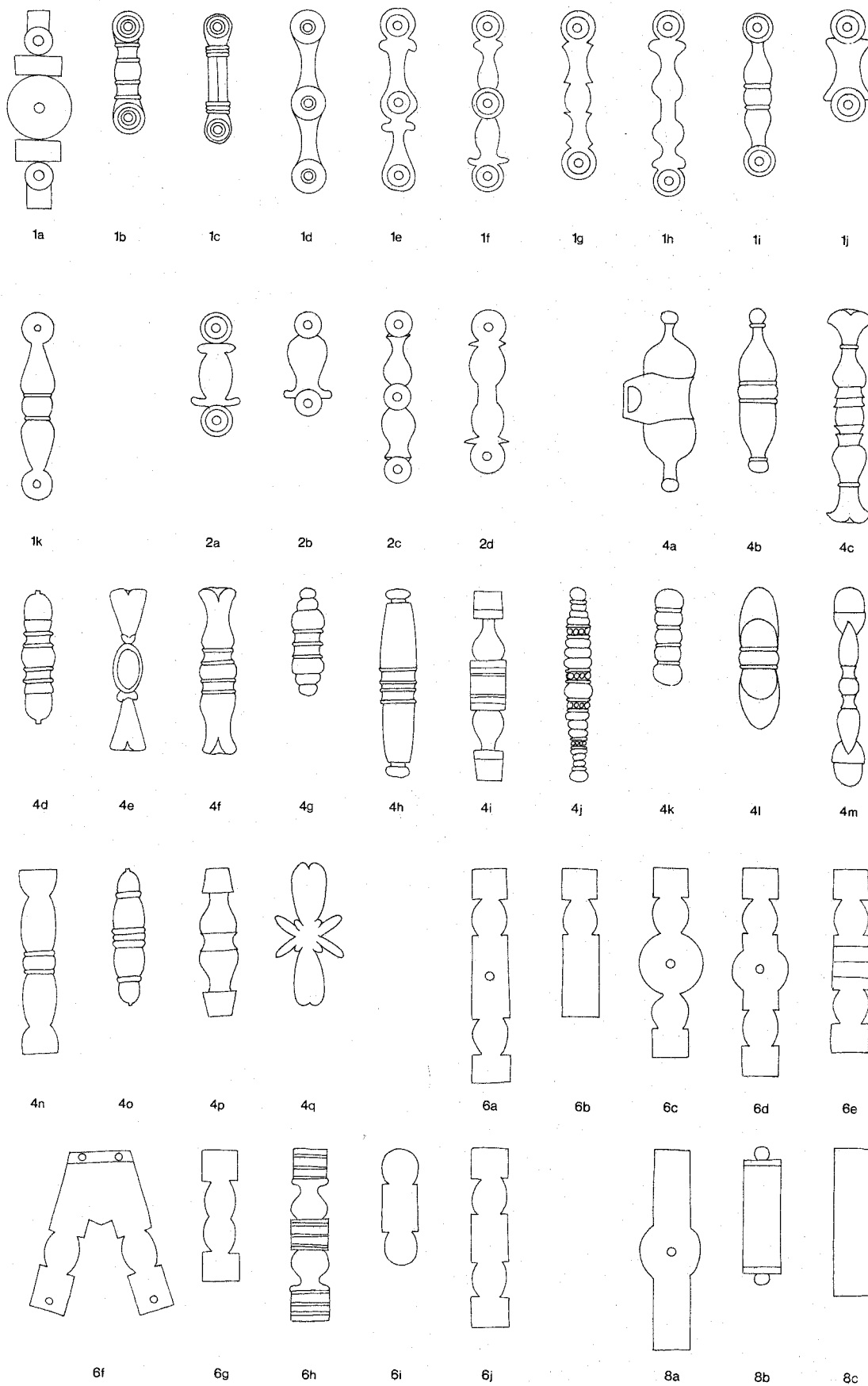


Fig.55: Type sketches for strap fasteners (male).



**Fig.56:** Type sketches for strap mounts.

## STRAP MOUNTS

Type	Site	Length (mm)	Width (mm)	Reference
1a	Sheepen	70.0	26.0	HAWKES & HULL, 1947, Pl.CIII,21
1b	Gellep	53.0	16.0	PAAR & RUGER, 1971, Bild 23,24
1o	Riðtissen	55.0	13.0	ULBERT, 1959, Taf.62,14
1d	Hofheim	70.0	15.0	RITTERLING, 1913, Taf.XIII,17
1d	LincoIn	66.0	14.0	Unpublished
1d	Neuß	64.0	13.0	LEHNER, 1904, Taf.XXXA,7
1e	Hüfingen	51.0	13.5	ORL Nr.62a, Taf.XI,4
1f	Mainz	63.0	10.0	BEHRENS, 1918, Abb.8,9
1g	Mainz	53.0	14.0	<u>Ibid.</u> , Abb.8,10
1h	Unknown	62.0	12.0	BOUBE-PICCOT, 1964, No.44
1i	Vindonissa	58.0	13.0	UNZ, 1973, Abb.10,112
1j	Dormagen	31.0	14.0	MULLER, 1979, Taf.79,21
1k	Manton Down	69.0	12.0	GRIFFITHS, 1983, No.15
2a	Hofheim	40.5	12.0	RITTERLING, 1913, Taf.XIII,10
2b	Augsburg- Oberhausen	41.0	16.0	HÜBENER, 1973, Taf.13,10
2c	Augsburg- Oberhausen	60.0	12.0	<u>Ibid.</u> , Taf.13,27
2c	Augsburg- Oberhausen	66.0	9.0	<u>Ibid.</u> , Taf.13,28
2d	Canterbury	60.0	17.0	HASSALL, 1980, Fig.4,A
4a	Riðtissen	38.0	20.0	ULBERT, 1970, Taf.23,347 (length damaged)
4b	Hofheim	36.0	7.0	RITTERLING, 1913, Taf.XIII,21
4b	Rheingönheim	37.5	12.0	ULBERT, 1969, Taf.28,10
4b	Rheingönheim	43.5	12.0	<u>Ibid.</u> , Taf.28,11
4b	Riðtissen	40.0	12.0	<u>Id.</u> , 1970, Taf.23,351
4c	Riðtissen	53.0	10.0	<u>Ibid.</u> , Taf.23,349 (length damaged)
4d	Hod Hill	49.0	12.0	BRAILSFORD, 1962, Fig.3,A46
4d	Hod Hill	60.0	10.0	RICHMOND, 1968, Fig.56,17
4e	Hod Hill	58.5	14.0	<u>Ibid.</u> , Fig.56,18
4f	Hofheim	63.0	10.0	RITTERLING, 1913, Taf.XV,95
4f	Richborough	48.5	13.5	CUNLIFFE, 1968, Pl.XXXVII,125
4g	Gloucester	24.0	7.5	WEBSTER, 1960, Fig.5,102
4h	Ham Hill	57.0	12.0	<u>Ibid.</u> , Fig.5,124
4h	Hod Hill	58.5	13.0	RICHMOND, 1968, Fig.56,16 (length damaged)
4i	Sheepen	44.0	11.0	HAWKES & HULL, 1947, Pl.CII,28
4j	Newstead	48.0	9.0	CURLE, 1911, Pl.XCII,4
4k	Xanten	30.5	10.0	HINZ, 1971, Bild 35,6
4l	Rheingönheim	56.0	12.0	ULBERT, 1969, Taf.28,12
4m	Hofheim	58.5	10.5	RITTERLING, 1913, Taf.XIII,20
4n	Folly Farm	54.0	12.0	GRIFFITHS, 1983, No.10 (length damaged)
4o	Verulamium	34.0	9.5	FRERE, 1972, Fig.32,37
4p	Verulamium	33.5	10.0	FRERE, 1984, Fig.12,83
4q	Verulamium	52.5	15.0	<u>Ibid.</u> , Fig.12,84
4r	Chester	43.5	18.0	Unpublished (140.R.52)
4r	Woodcock Hall	40.0	15.0	BROWN, 1986, No.213
6a	London	67.5	7.5	WEBSTER, 1960, Fig.6,164
6b	Alise-Saint-Reine	35.0	0.0	RABEISEN & MENU, 1985, Fig.7,38
6b	Augsburg Oberhausen	35.5	10.5	HÜBENER, 1973, Taf.11,6
6b	Burlafingen	34.0	8.0	MACKENSEN, 1987, Abb.43,3
6b	Colchester	37.0	7.0	<u>Ibid.</u> , Fig.4,64
6b	Fremington Hagg	45.0	14.0	WEBSTER, 1971, Fig.14,69 (length damaged)
6b	Fremington Hagg	32	10	<u>Ibid.</u> , Fig.14,70 (length damaged)

**Table 11**

6b	Kempton	38.0	10.0	MACKENSEN, 1987, Abb.66,7
6c	Aislingen	61.5	18.0	ULBERT, 1959, Taf.18,2
6c	Doorwerth	112.0	36.0	BROUWER, 1982, Nr.256
6c	Doorwerth	109.0	35.0	<u>Ibid.</u> , Nr.257
6c	Doorwerth	107.0	34.0	<u>Ibid.</u> , Nr.258
6c	Doorwerth	108.0	33.0	<u>Ibid.</u> , Nr.259
6c	Doorwerth	109.0	35.0	<u>Ibid.</u> , Nr.260
6c	Doorwerth	104.0	32.0	<u>Ibid.</u> , Nr.261
6c	Doorwerth	104.0	33.0	<u>Ibid.</u> , Nr.262
6c	Doorwerth	103.0	35.0	<u>Ibid.</u> , Nr.263
6c	Doorwerth	101.0	33.0	<u>Ibid.</u> , Nr.264
6c	Doorwerth	101.0	32.0	<u>Ibid.</u> , Nr.265
6c	Doorwerth	102.0	33.0	<u>Ibid.</u> , Nr.266
6c	Doorwerth	100.0	34.0	<u>Ibid.</u> , Nr.267
6c	Doorwerth	99.0	34.0	<u>Ibid.</u> , Nr.268
6c	Doorwerth	97.0	34.0	<u>Ibid.</u> , Nr.269
6c	Doorwerth	96.0	33.0	<u>Ibid.</u> , Nr.270
6c	Fremington Hagg	56.5	20.5	WEBSTER, 1971, Fig.14,59 (length damaged)
6c	Fremington Hagg	73.0	22.0	<u>Ibid.</u> , Fig.14,63
6c	Hofheim	58.5	17.0	RITTERLING, 1913, Taf.XII,21
6c	Hofheim	58.5	13.5	<u>Ibid.</u> , Taf.XV,94
6c	Newstead	66.5	15.5	CORLE, 1911, Pl.XCII,2
6c	Rheingönheim	71.0	18.0	ULBERT, 1969, Taf.28,24
6c	Richborough	43.0	20.0	CUNLIFFE, 1968, Pl.XXXVII,126 (length damaged)
6c	Riðtissen	50.0	20.0	ULBERT, 1959, Taf.62,1 (length damaged)
6c	Riðtissen	63.0	20.0	<u>Ibid.</u> , Taf.62,2
6c	Sheepen	67.0	17.0	HAWKES & HULL, 1947, Pl.CIII,20
6c	Thamusida	84.0	20.0	BOUBE-PICCOT, 1964, No.38
6d	Aislingen	61.5	18.0	ULBERT, 1959, Taf.18,1
6d	Aislingen	60.0	18.0	<u>Ibid.</u> , Taf.18,3 (length damaged)
6d	Chichester	66.5	16.5	DOWN & RULE, 1971, Fig.3.18,4
6d	Doorwerth	89.0	18.0	BROUWER, 1982, Nr.272
6d	Doorwerth	85.0	18.0	<u>Ibid.</u> , Nr.273
6d	Doorwerth	84.0	19.0	<u>Ibid.</u> , Nr.274
6d	Fremington Hagg	54.0	13.0	WEBSTER, 1971, Fig.14,57
6d	Fremington Hagg	71.5	14.5	<u>Ibid.</u> , Fig.14,62
6d	Hüfingen	69.0	15.0	ORL Nr.62a, Taf.XI,18
6d	Hüfingen	75.0	15.0	<u>Ibid.</u> , Taf.XI,26
6d	Neuß	74.0	20.0	LEHNER, 1904, Taf.XXXA,1
6d	Rheingönheim	51.0	13.5	ULBERT, 1969, Taf.28,25
6d	Rheingönheim	80.0	18.0	<u>Ibid.</u> , Taf.28,26
6d	Riðtissen	60.0	13.5	<u>Id.</u> , 1959, Taf.62,4
6d	Riðtissen	78.0	17.0	<u>Id.</u> , 1970, Taf.1,14 (width damaged)
6d	Sheepen?	66.0	15.5	CRUMMY, 1983, No.4219
6d	Waddon Hill	41.0	13.0	WEBSTER, 1979, Fig.28,40 (damaged)
6d	Wiesbaden	75.0	20.0	ORL Nr.31, Taf.X,52 (length damaged)
6d	Xanten	100.0	13.0	JENKINS, 1985, No.D40
6d	Xanten	102.5	25.0	<u>Ibid.</u> , No.D42
6d	Xanten	89.0	24.0	<u>Ibid.</u> , No.D43
6d	Xanten	100.0	25.0	<u>Ibid.</u> , No.D44
6d	Xanten	57.0	24.5	<u>Ibid.</u> , No.D45 (length damaged)
6d	Xanten	?	23.0	<u>Ibid.</u> , No.D46 (length damaged)
6d	Xanten	?	?	<u>Ibid.</u> , No.D54 (damaged)
6d	Xanten	?	24.5	<u>Ibid.</u> , No.D55 (length damaged)
6d	Xanten	?	24.0	<u>Ibid.</u> , No.D56 (length damaged)
6d	Xanten	44.0	?	<u>Ibid.</u> , No.D58 (damaged)
6d	Xanten	34.0	11.0	<u>Ibid.</u> , No.D59 (damaged)
6e	Doorwerth	59.0	17.0	BROUWER, 1982, Nr.279

**Table 11**

6e	Fremington Hagg	53.0	9.0	WEBSTER, 1971, Fig.14,56
6e	Harlow	54.0	12.5	FRANCE & GOBEL, 1985, Fig.46,121
6e	Rheingönheim	52.5	9.0	ULBERT, 1969, Taf.28,21
6f	Doorwerth	87.0	33.0	BROUWER, 1982, Nr.275
6f	Hüfingen	48.0	24.0	REVILLIO, 1929, Abb.4,16 (damaged)
6f	Hüfingen	52.5	27.0	<u>Ibid.</u> , Abb.4,17 (damaged)
6g	Baden	47.0	10.0	UNZ, 1971, Abb.5,35
6g	Banasa	46.0	11.0	BOUBE-PICCOT, 1964, No.43
6g	Fremington Hagg	41.5	7.5	WEBSTER, 1971, Fig.14,66
6g	Fremington Hagg	46.0	10.0	<u>Ibid.</u> , Fig.14,68
6g	Hofheim	48.0	9.0	RITTERLING, 1913, Taf.XV,88
6g	Rheingönheim	45.0	13.5	ULBERT, 1969, Taf.28,23 (length damaged)
6g	Rißtissen	40.0	9.0	<u>Id.</u> , 1959, Taf.62,8
6g	Rißtissen	38.0	9.0	<u>Id.</u> , 1970, Taf.23,352
6g	Thamusida	46.0	8.0	BOUBE-PICCOT, 1964, No.42
6g	Verulamium	38.0	11.0	FRERE, 1972, Fig.32,39 (length damaged)
6g	Verulamium	47.5	12.5	FRERE, 1984, Fig.12,82
6g	Volubilis	45.0	9.0	BOUBE-PICCOT, 1964, No.41
6g	Woodcock Hall	47.0	11.0	BROWN, 1986, No.207
6h	Rheingönheim	57.0	17.0	ULBERT, 1969, Taf.28,20 (length damaged)
6i	Rißtissen	49.5	16.5	ULBERT, 1959, Taf.62,19
6j	Stockton	58.0	10.0	GRIFFITHS, 1983, No.21
8a	Alise-Sainte-Reine	72.0	14.0	RABEISEN & MENU, 1985, Fig.7,33
8a	Baden	69.0	12.0	UNZ, 1971, Abb.5,36 (width damaged)
8a	Hüfingen	42.0	16.0	REVILLIO, 1929, Abb.3,3 (length damaged)
8a	Hüfingen	47.5	18.5	<u>Ibid.</u> , Abb.3,6 (length damaged)
8a	Hüfingen	75.5	15.0	<u>Ibid.</u> , Abb.3,9
8a	Hüfingen	84.0	21.0	ORL Nr.62a, Taf.XI,20
8b	Verulamium	42.0	11.5	FRERE, 1972, Fig.32,41 (length damaged)
8c	Ham Hill	34.5	9.0	<u>Ibid.</u> , Fig.5,118
8c	Sheepen	60.0	12.0	WEBSTER, 1960, Fig.4,67

**Table 11**

## NOTES

1. This paper was originally submitted in 1982 for inclusion in the projected volume Roman Military Studies 1. When this still had not appeared in January 1986, contributors withdrew their papers for publication elsewhere, and this has allowed a complete revision of the text and illustrations in line with more recent information about Roman horse equipment.
2. Throughout this paper, the term 'cavalry' has been used, although the writer fully realises that material from horses belonging to officers, and even civilians, may be included in the archaeological record. Furthermore, in its narrowest sense, the term would refer to horse troops of the alae and cohortes equitatae, although the equites legionis can conveniently be included without implying that the tactical role of the latter was as cavalry per se.
3. Cf. ROBINSON, 1975, 7.
4. GABELMANN, 1972, 115-23.
5. SCHLEIERMACHER, 1984.
6. There is no modern detailed study of the Totenmahl reliefs to compare with Schleiermacher's treatment of Reiter tombstones (above, note 5).
7. The problem of the accuracy of representational evidence is one that has not been explored adequately, particularly in relation to provincial reliefs. It is (necessarily) assumed in this paper that some depictions at least were accurate.
8. E.g. RICHMOND, 1935; WEBSTER, 1985, passim.
9. Cf. ROBINSON, 1975, 7.
10. AMY et al., 1962.
11. Most horse equipment recovered from the archaeological record is scrap (BISHOP, 1985b) and even objects in hoards usually show some signs of damage. It has been suggested that the Doorwerth hoard was connected with the revolt of Civilis in A.D.69/70 (BROUWER, 1982, 166).
12. On the spatial distribution of equipment, see BISHOP, 1986.
13. Doorwerth: HOLWERDA, 1931; BROUWER, 1982; Xanten: JENKINS, 1985; Fremington Hagg: WEBSTER, 1971; CRADDOCK et al., 1973; Canterbury: publication forthcoming, but see HASSALL, 1980. I am grateful to the Canterbury Archaeological Trust for the opportunity to examine the Marlowe Street car park material.
14. The present catalogue is selective and by no means complete, but instead uses examples which illustrate the range of depictions of



horse equipment.

15. Most of the Rhineland tombstones were visited by the writer in September 1982, when the opportunity was taken to inspect and photograph them in detail. Where stones have been examined thus, it has been noted below.
16. SCHLEIERMACHER, 1984, Nr.77; RIB 1172. Pers. obs., July 1986.
17. SCHLEIERMACHER, 1984, Nr.79; RIB 121. Pers. obs., May 1983.
18. SCHLEIERMACHER, 1984, Nr.75; RIB 109. Pers. obs., May 1983.
19. SCHLEIERMACHER, 1984, Nr.76; RIB 201.
20. ESP.6465; NOELKE, 1977, 10-14; WEIGHSELBAUMER, 1977. Pers. obs., September 1983.
21. SCHLEIERMACHER, 1984, Nr.17; ESP.6435. Pers. obs., September 1982.
22. Inv.Nr.25. Pers. obs., September 1982.
23. ESP.6465. Pers. obs., September 1982.
24. SCHLEIERMACHER, 1984, Nr.18; ESP.6436. Pers. obs., September 1982.
25. ESP.6448. Pers. obs., September 1982.
26. ESP.6454. Pers. obs., September 1982.
27. ESP.6455.
28. SCHLEIERMACHER, 1984, Nr.5; ESP.6283. Pers. obs., September 1982.
29. SCHLEIERMACHER, 1984, Nr.6. Pers. obs., September 1982.
30. LEHNER, 1918, Nr.654. Pers. obs., September 1982.
31. ESP.6463. Pers. obs., September 1982.
32. SCHLEIERMACHER, 1984, Nr.9; ESP.6292. Pers. obs., September 1982.
33. SCHLEIERMACHER, 1984, Nr.22; ESP.5784. Pers. obs., September 1982.
34. ESP.5838. Pers. obs., September 1982.
35. SCHLEIERMACHER, 1984, Nr.26; ESP.5786. Pers. obs., September 1982.
36. SCHLEIERMACHER, 1984, Nr.20; ESP.5854. Pers. obs., September 1982.
37. SCHLEIERMACHER, 1984, Nr.27; ESP.5852. Pers. obs., September 1982.
38. SCHLEIERMACHER, 1984, Nr.19. Pers. obs., September 1982.
39. Ibid. Nr.30. Pers. obs., September 1982.

40. Ibid. Nr.46; ESP.6018. Pers. obs., September 1982.
41. SCHLEIERMACHER, 1984, Nr.45; ESP.6014. Pers. obs., September 1982.
42. SCHLEIERMACHER, 1984, Nr.47; ESP.6016. Pers. obs., September 1982.
43. SCHLEIERMACHER, 1984, Nr.36; ESP.5870. Pers. obs., September 1982.
44. SCHLEIERMACHER, 1984, Nr.92; ESP.2150.
45. AMY et al., 1962.
46. Ibid. pl.16; pl.44 harnachements IIa, IIb; selles IIa.
47. Ibid. pl.17; pl.44 selles Ia.
48. Ibid. pl.18; pl.44 harnachements IVa, IVb, IVc; selles IVa, Ivb, IVc.
49. Ibid. pl.29.
50. Loc. cit.
51. Ibid. pl.30.
52. Loc. cit.
53. Ibid. fig.51; pl.28.
54. Ibid., fig.50; pl.28.
55. ROLLAND, 1969.
56. Ibid. pl.25.
57. Ibid. pl.33,6.
58. Ibid. pl.27.
59. Ibid. pl.28; pl.33 face sud 1.
60. FLORESCU, 1961. Pers. obs., September 1987.
61. CICHORIUS, 1900; LEHMAN-HARTLEBEN, 1926; Mr J.C. Coulston, pers. comm.
62. See GREEN, 1986, 171-5 on Celtic depictions of the horse (including pipeclay figurines) and the role of Epona.
63. LAWSON, 1978, Taf.52,2.
64. LEMAN, 1975, fig.26.
65. KLINDT-JENSEN, 1959; see also CONNOLLY, 1981, 114 fig.
66. ABDUL-HAK, 1955, 175-84 and pl.VII.

67. In the case of stones like those of T. Flavius Bassus or C. Romanus Capito, not only the phalerae and pendants are close to those found in the archaeological record, but the equipment of the rider himself, such as the helmet (cf. KLUMBACH, 1974, Nr.32, Taf.32) and the lorica hamata fastening hook (ROBINSON, 1975, Pl.480).
68. Unfortunately, the whole question of the accuracy (and consistency) of first century representational tombstones has yet to be tackled seriously in the literature, where art-historical aspects of the reliefs are usually favoured.
69. Leather adhering: CURLE, 1911, 177-8; HAWKES & HULL, 1947, 339.
70. Newstead: CURLE, 1911, 177 & Fig.17; Neuß: LAWSON, 1978, Taf.52,1; Moers-Asberg: HORN, 1977, 83.
71. CURLE, 1911, Pl.XXXII.
72. Clearly visible on the examples found in 1980 at Neuß (TAUCH, 1983, 10 fig.).
73. KESSLER, 1940, Abb.7,1-2.
74. For one suggestion on the method of fastening the fixed part of the girth strap to the saddle, see CONNOLLY, 1987, 11.
75. Analysis of the Castleford plates, using atomic absorption spectroscopy, showed them to be of brass of around 85/15 composition.
76. It was not possible to analyse this tinning satisfactorily, but it was clearly a wash, as opposed to plating.
77. BROUWER, 1982, 157 esp. n.54.
78. L-shaped section: Castleford (report forthcoming); circular section: Moers-Asberg (BECHERT, 1974, Abb.71,1).
79. Cf. the analyses by CRADDOCK et al., 1973 and Craddock and Lambert in JENKINS, 1985, 162-4.
80. JENKINS, 1985, 145; BROUWER, 1982, 148.
81. See the comments by BOUBE-PICCOT, 1964, 175 with reference to his no. 13.
82. See BISHOP, 1987 for a discussion of functional and decorative typologies, with reference to phalerae.
83. JENKINS, 1985, 145.
84. An object from Cirencester (WACHER & MCWHIRR, 1982, Fig.35,98), although included as Type 1v amongst the pendants, is not a true pendant: the ring at the top betrays the fact that it is more akin

to the phallic 'pendants', so it may belong with vehicle harness; similarly, the studs on the rear suggest that it was attached to a backing of some sort. In addition, the inlaid decoration is fairly crude.

85. BROUWER, 1982, Abb.4 includes a grammar of decorative motifs used on the Doorwerth objects.
86. The inscription PLINIO PRAEF(ECTO) EQ(UITUM), which is normally taken to refer to the Elder Pliny (JENKINS, 1985, 154-5), thus dating one of the phalerae to his spell as commander of an ala in Germany - in the late forties or fifties A.D. (ibid. 157). This appears to be the earliest date that is archaeologically sound for a Type 1 pendant.
87. The association of Type 1 and 2 pendants in both the Doorwerth and Fremington Hagg assemblages would seem to be strongly suggestive of contemporaneity, a notion supported by their common decorative style.
88. Similar objects were also used to decorate tool sheaths (AuhV 5, Taf.10,167; JUNKELMANN, 1986, Taf.70c).
89. The earliest pieces would appear to be those from Bern-Engelhalbinsel (MÜLLER-BECK & ETTLINGER, 1963, Taf.57,4-5).
90. Augustan period: Haltern (MAKW 2, 120 Abb.); Rodgen (SCHÖNBERGER & SIMON, 1976, Taf.41,6); second century: CHIRILA et al., 1972, Taf.LXXI,28.
91. An example of a phallic pendant with junction loops comes from Nijmegen (ZADOKS-JOSEPHUS JITTA & WITTEVEEN, 1977, Pl.32,18).
92. FORRER, 1927, fig.435.
93. Examples come from early contexts at Colchester (CRUMMY, 1983, Nos.4200-01), as well as from Buciumi in Dacia (CHIRILA et al., 1972, Taf.CXIV,28).
94. Only Colchester Sheepen, the Lunt, and Canterbury (see catalogue) produce fittings of this type.
95. In Britain, with the exception of a piece from Newstead, they are mostly confined to the south (see catalogue).
96. The piece from Augsburg-Oberhausen (HÜBENER, 1976, Taf.11,6) is very much an oddity in this supposedly Augustan assemblage; whilst, most of the equipment looks genuinely early, this strap **mount** appears to be intrusive.
97. Their association with pendants of Types 6 and 10 has already been noted.
98. Nijmegen: BOGAERS & HAALEBOS, 1975, 156 & pl.LII,1a-d; Arlaines: BOUSQUET, 1977, pl.XLII,Ar.76-37.

99. This need not, of itself, mean that ring junctions were more common than those using phalerae - for it could be argued that the wear on ring junction fittings was responsible for a higher attrition rate amongst fittings.
100. For discussion of the reasons why artefacts are deposited in the archaeological record, see BISHOP, 1985; 1986.
101. 'Harness clip': NIBLETT, 1985, 3:C1; 'baldric clip': loc. cit. no.101; 'harness loop': FRERE & ST.JOSEPH, 1974, 56-8; 'baldric mount or apron terminal': HURST, 1985, 28 no.7; 'strap loop': CRUMMY, 1983, 132 Nos.4199-4201.
102. BROUWER, 1982, Taf.2,144.
103. Cf. ibid. Taf.10.
104. Since it would have been easier this way. In fact, this form of fastening is very specialised, as it is not adjustable (one of the reasons why such fastenings would be of little use for a baldric, where a buckle is better suited to the task).
105. These rivet heads usually take the form of domed or dished studs with niello inlay.
106. CONNOLLY, 1987, 12; RICHARDSON, 1982, 64-6.
107. Ibid. 67-71.
108. CONNOLLY, 1987, 7.
109. Ibid. 11-12.
110. It is unlikely that horns were manufactured purely to give the saddler a guide to the shape of the pommels, if he were making them out of wood - cf. loc. Cit.
111. CURLE, 1911, 177.
112. Ibid. Pl.XXXII.
113. But compare the different arrangements on western saddles (RICHARDSON, 1982, 116 figure).
114. AMY et al., 1962, pl.44, selles IVb, Iia.
115. As on the tombstones of T. Flavius Bassus and Vonatorix (see the section of representational evidence for more examples).
116. See Table 2.
117. Breastplate: RICHARDSON, 1982, 108; crupper: ibid. 107.
118. Cf. ibid. 108 plate. Most modern martingales join the reins at some point and are designed to keep the horse under the control of the bit (ibid. 60-1). The Roman martingale is more like that found

in modern driving harness, where it stops the breastplate riding up and choking the horse (RICHARDSON, 1982, 131).

119. JENKINS, 1985, 148 & Pl.XB.

120. VAN DRIEL-MURRAY, 1985, 44-6.

121. Loc. Cit.

122. I am particularly grateful to Dr van Driel-Murray for advice in correspondence on this matter and to Mr Connolly for pointing out that double stitching was employed here, on the evidence of the Xanten phalera (see note 120).

123. GANSSE-BURCKHARDT, 1942, Abb.14. I am grateful to Peter Connolly for suggesting the advantages of rounded strap ends.

124. JENKINS, 1985, 156-7.

125. See the discussion of the Gundestrup cauldron above; for phalerae in Halstatt period harness, see KOSSACK, 1954, 116-7 with Abb.1.

126. It is in this light that inlaid niello decoration concerned with viticulture, and relief decoration related to oak symbolism, must be viewed (BISHOP, 1987, 118).

127. ZADOKS-JOSEPHUS JITTA & WITTEVEEN, 1977, 173; the usual symbol for the sun was a spoked wheel (cf. GREEN, 1986, 39-55).

128. FINGERLIN, 1981, 430.

129. BISHOP, 1987, 118.

130. VINCE, 1968.

131. Cf. HENIG, 1984, 184-8 for a discussion of superstitious practices and the use of amulets.

132. Such rivet holes are often found on Type 7a pendants - cf. HURST 1985, Fig.11,1 & 3.

133. PALAGYI, 1986, Abb.7,3.

134. For bits, see RICHARDSON, 1982, 32-49.

135. JENKINS, 1985, Fig.11.

136. The essence of control with the bridle are the seven pressure points (RICHARDSON, 1982, 30-1) and Celto-Roman harness was able to exploit all of these.

137. See above, 'Representational Evidence', No.33.

138. I am very grateful to Mr J.C. Coulston for discussion on the subject of the accuracy of depictions on Trajan's Column.

139. As in the case of the scale bards from Dura-Europos (ROBINSON, 1975, Pls. 529-30), where a hole is left for the saddle.
140. Although strictly this would not be necessary (RICHARDSON, 1982, 106).
141. T. Calidius Severus: ROBINSON, 1975, Pl. 445; HOFMANN, 1905, 31.
142. CONNOLLY, 1987, 11.
143. BROUWER, 1982, 157, citing a relief from Auxerre (ESP. 2885). This clearly shows a shabracque with square patterning all over it, which Brouwer suggests as the probable explanation for the 'saddle plates' on the Rhineland tombstones. However, the objects on the Rhineland tombstones are very clearly attached to triplet straps, and cannot be explained in this way. Similarly, the saddle on the north-east face of the arch at Orange (which Brouwer does not cite) has no shabracque under it and again depicts rectangular plates fastened to straps (see Fig. 19, 3).
144. AMY et al., 1962, pl. 44, selles IIa.
145. Saddles: GROENMAN-VAN WAATERINGE, 1967, Figs. 35, 1; 38, 9; Connolly's reconstruction (1987, Fig. 2) suggests that the broader sets were at the front of the saddle.
146. Rivets are usually placed in threes, joined horizontally by bars on the rear face.
147. ROLLAND, 1969, pl. 33, 'face nord' 1-4.
148. Krefeld-Gellep: PIRLING, 1971; 1977; 1986; NOBIS, 1973. Newstead: J.C. Ewart in CURLE, 1911, 362-71. For other sites, see NOBIS, 1973, 225-7. I am grateful to Peter Connolly for making me aware of this last reference.
149. Horses are generally represented as too small in comparison to their riders, probably in order to emphasize the human figure (cf. COULSTON, 1986, 62).
150. Size: NOBIS, 1973, 232-40; age: ibid., 232; sex: loc. cit.
151. E.g. Vonatorix (above, 'Representational Evidence', No. 17) and Annauso (ESP. 5785). Later cavalry tended to avoid the use of stallions, since they were prone to be temperamental and could be distracted by mares in season.
152. DAVIES, 1962, 447-8.
153. Cf. EADIE, 1967, 166; CHEESMAN, 1914, 104.
154. JENKINS, 1985, Fig. 15.
155. Vercundi: ibid. Fig. 9; T. Capitoni Marian: ibid. Fig. 4; for the decoration on the face of A1, see ibid. Fig. 2, and for that of the B series pendants ibid. Fig. 7; note the style of the tendrils and

leaves in each case. However, see. now SADDINGTON, 1987, where it is suggested that the reading should be T(urma) Capitoni Marian(i) - 'belonging to the turma of Capitonius Marianus'.

156. Ibid. Fig.10.

157. It is not possible to agree with Jenkins that 'the Xanten horse-trappings are... the most complete, single surviving set of Roman military horse-trappings of their kind' (ibid. 141) since their circumstances of discovery remain a mystery. Ironically, the Nawa material (unfortunately only partially published in ABDUL-HAK, 1955, 187-8 and pl.XI) is thus the most important discovery of this nature, since it appears to have been part of the contents of a burial with equipment.

158. This very point is considered by MAXFIELD, 1986, 66. It is important to stress that draught harness would have been (and still is) very different from riding harness (which met the specific needs of the mounted warrior), so confusion is unlikely to arise here.

159. KEPPIE, 1984, 79; 100.

160. Josephus, Bell. Iud. III,6,2; BREEZE, 1969, 53-5.

161. Cf. SADDINGTON, 1982, 137-68.

162. KIECHLE, 1964, 114-22.

163. Arrian Tech. Takt. 33,1; KIECHLE, 1964, 89.

164. COULSTON, 1986. For what might be termed a 'primitivist' view of Roman horsemanship, admittedly based largely upon the evidence of North African mosaics, see CHURCHES, 1983.

165. In the first instance, he apparently did not intend going into battle with the cavalry himself (Bell. Iud. V,52), but evidently learned from this expertise and utilised them (V,288) as a strike-force to save the day at least once.

166. Cf. KIECHLE, 1964, 89-107 passim.

167. Cf. list on ibid. 149.

168. DRINKWATER, 1979, 97-8; SADDINGTON, 1982, 148; 150-1.

169. Taking 87 of the better-known first century figured tombstones (but only those depicting military equipment) from Britain and the Germanies, the proportions are as follows: cavalry 54%, auxiliary infantry 19%, legionaries 14%, centurions 6%, unknown infantrymen 6%, legionary cavalry 1%. However rough and ready this survey may be, it gives a good idea of the general trend.

170. HOFMANN, 1905, 31.

171. See, for example, the Reiter tombstone of the tribune L. Pompeius



Marcellinus (SCHLEIERMACHER, 1984, Nr.122).

172. It has been suggested that one phalera from Xanten may have belonged to the Elder Pliny (JENKINS, 1985, 154), but a number of alternative interpretations of the inscription in question have been suggested (ibid. 155-6).
173. There would probably have been under 200 sets of harness belonging to a legion, even allowing for the equites legionis, officers' horses, and the mounts of centurions. The provision of remounts would, naturally, mean there would be more animals than this bare minimum (officers probably had more than one horse and there must have been a general unit 'pool' of spare animals; cf. DAVIES, 1962, 429 and n.3).
174. Some of the devices employed are illustrated in GLASBERGEN & GROENMAN-VAN WAATERINGE, 1974, Fig.13.
175. The beltplates of Annaius Daverzus (ULBERT, 1968, Abb.14) are a familiar example.
176. Small find reports frequently display confusion as to whether beltplates are tinned or silvered, but as a rule, niello-inlaid belt plates seem to have been tinned in most cases. Hopefully, scientific analysis will offer more accurate information on this at a future date.
177. Cf. BROUWER, 1982, Abb.4. For details of the silvering process, see JENKINS, 1985, 145.
178. Type 8 strap fittings are notable for this.
179. VON PETRIKOVITS, 1952.
180. Although the burials with riding horses at Inota are presumably civilian, their nature suggests considerable social status (PALAGYI, 1986).
181. Cf. FRERE & ST.JOSEPH, 1974; NIBLETT, 1985; BROWN, 1986.
182. E.g. LEHNER, 1904, Taf.XXXA & B; ORL Nr.62a, Taf.XI.
183. E.g. WEBSTER, 1971 where the illustrations are captioned as 1:2, but are reproduced at 1:1.
184. FEUGÈRE, 1982.
185. In the case of the Buciumi phalera (CHIRILA et al., 1972, Taf.LXXX), it is illustrated from the front and side, whilst the Nawa examples are shown only from the front (ABDUL-HAK, 1955, Pl.XI,1).
186. FEUGÈRE, 1982, 11 (2.1.4).
187. Cf. BROUWER, 1982, Abb.5-6.

188. Whilst the difference between ancient and modern damage is usually readily apparent on the object itself, it is seldom possible to convey this by means of an archaeological illustration - cf. LEAHY, 1980.
189. FEUGÈRE, 1982, 7 (1.2.2).
190. See BISHOP & DORE, forthcoming, for a discussion of the various military ditches at Corbridge.
191. This is demonstrated by the mould for a junction loop found at Nijmegen (BOGAERS & HAALEBOS, 1975, 156 and Pl.LII,1a-d).
192. OLDENSTEIN, 1977, 75-6.
193. Cf. BISHOP, 1985b, 15; 1987, 111.

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